# COMPUTERWORLD

# INSIDE

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In Depth — Step right up and rate your programming languages. Page 97.



IBM benchmarks itself, using Debit/Credit standard

Back-room previews expected to dominate PC highlights at this year's Comdex. Pages 14-16.

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Wang's image shines in the current market for imaging systems, but the threat of IBM looms ever

closer. Page 4.

The Presentation Manager battling against the tide as users evaluate costs of implementation and limitations of the initial version. Page 156.

Callinet shaken up again as former M&D whiz Robert Weiler moves into the president's office.

# Virus ravages thousands of systems

BY MICHAEL ALEXANDER

System managers scrambled madly last week to assess the virus planted in a nationwide net work brought thousands of com-

The program, a type of virus commonly referred to as a worm se of its ability to slip into computer systems and prop-agate itself, was discovered Wednesday on computers linked to the Internet network. In ternet ties several networks throughout the nation and is pre dominantly used by universities research laboratories, federa agencies and other institutions. Estimates of the number of sys-tems affected ranged from 6,000

Surge to IBM bus stalling clone option?

BY WILLIAM BRANDEL

After more than a year of deri-sion, IBM's Micro Channel Architecture appears to be gaining strength as a market standard. But clone vendors that have ended behind a proposed alter-stive declared last week that they have no intention of provid-ing what users now seem to be

Vendors supporting the Ex-tended Industry Standard Archi-tecture indicated last week that they will stick with the alternative they announced in Septem-

momentum for the MCA
seems to be surging. International Technology Group's Clare
Fleig estimated that 2.6 million
MCA machines will be inContinued on page 8

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As the worm turns A ween program 2.Po designed to find a smured resources lie

It may be several weeks be

nt may be several words or ore the virus is entirely purged om all the computers on the stem — particularly comput-rs operated at remote sites and ns, where users are not ed to trap the virus. But organizations said they

for affected operating systems.

As the program replicates itself, it ties up computers, eventually bogging them down, said Stephen Hall, director of the of-

ness reaction and o erage. Page 157.

at Harvard University, where Sun Microsystems, Inc. work-stations took the brust of the as-sault. While malicious, the virus appurently does not damage or destroy files but is simply a pain in the neck, Hall said. The most severe impact known as of late Friday was a

Research Center in Mountain View, Calif. According to a spokessman, the systems had not been brought back into service as of mid-Friday; the number of systems immerted year and more

Lawrence Livermore Leauwsu-ries in California, "The worm af-fected the system parameters for how many users can be ac-tive. Those tables are finite and linked. The tables were filling up so no other active users could

so no other active uners could use the system."

James D. Bruce, a professor and vice-president for information systems at MIT, said the virus showed up in the university's Digital Equipment Corp. VAX systems early Wednesday and spread to 200 of the approximately 2,000 computers in use at the Cambridge., Mass., instituted.

tution.

Federal agencies are expected to conduct their own internal investigations to see whether any harm was done, according to Richard Adams, spokesman for the U.S. Secret Service in Wash-Continued on page 151

# COMPUTERS AND POLITICS High-tech a campaign also-ran

BY JAMES DALY and NELL MARGOLIS

t'a almost over. Nearly two years after the first candidate threw his fedors into the ring, the American public will file to the polls tomorrow, collectively cast its vote and turn Election '86 into

As the remaining weeks turned into days and the days now dwindle into hours, com-puters remain everywhere in

at the core.

Like any other large-scale
business, electing a president
rests on an underpinning of
automated offices. Campaigncritical tasks such as tracking
financial costributions, identi-



nice-guy image and the 11th-hour necessity of getting out the vote, the rate of

DECEMBER SHOULD SHOULD BE SHOULD SHOU

REITY HICROFILMS INT RESTRY HICKOFILMS INT

# IN THIS **ISSUE**

Junior makes five. The newest member of the Cray-2 family provides 30% more throughput than its older siblings — for only \$17 million. Page 10.

Some to grow on. Tandem unveils four expansive Nonstop VLX high-end configurations with four to 32 processors as well as two entry-level units, Page 18.

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TCP/IP link on UCLA cam-

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I t's OK to say the U-seord."

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DEPARTMENTS

is one ept is of para

intes, Inc. announced Ma on TLPM, which it claims I enable Mac II and SE use

Apple is now seriously considering the RISC

BY JULIE PITTA

CUPERTINO, Calif. — Apple Computer, Inc. is evaluating reduced instruction set computing (RISC) microprocessors and in ating the possibility of ig its own RISC chip, a

company official said fast week Charles Oppenheimer, mager of Apple's Macintosh pro uct line, acknowledged "seve rega

RISC. However, Oppenheime declined to specify when a RISC based Mac will be introduced.

maintained. "You've seen a 68030 from us, and you'll see a 68040," he said. "The promise of RISC is always better perfor-mance. But I don't think you can say that RISC is a require

in RISC, it remains committed to Motorola, Inc.'s 68000 line of

say that RISC is a requirement for any specific applications.

Industry watchers said Mo-torois stands the best chance to supply Apple with RISC, based on the firms long vendor-suppli-er relationship. Motorois offion the initial stage ventor-apparer relationship. Motorola offi-cials confirmed that Apple is evaluating its 88000 RISC mic-roprocessor, introduced in April and scheduled to ship during the

# Bridgework bustle

The pressure's on to connect Macs to IBM hosts

to host applications such as IBM's VM Notes. BY PATRICIA KEEFE We view 3270 o CUPERTINO, Calif. — Apple Computer, Inc. is making up for lost time in building bridges be-tween its Macintools computers and IBM hosts. The goal is to po-sition the Mac as a terminal on an

one as strategic, and this an-ouncement is a key part of our efforts to gain a greater pres ence in that environment," But

IBM network.

"One of the greet lies is that you're bringing in a computer for stand-slone applications," and john McCarthy, director of research at Foreneter Research, inc. in Cambridge, Mass. "Apple is getting better up badly" in its large accounts. As these users matter, they want to lish their batters are the standard of the standard lish and the standard lish Arutar Technologies, and, supplier of micro-to-mainframe links, is said to be developing a similar driver for its Macminframe Mac-to-IBM host connecting will be accorded to the connection of the connecting will be accorded to the connection of the connection will be accorded to the connection of t

essociates, Inc er of IBM term d to announce a simi undling arrang

conference.

• Apple has said it will unwell its

connectivity, said Frank ck, president of Communisbeck, president of Commun-tion Network Architects, Inc. Mashington, D.C. He cited at dence Apple's recent pur-ue, of, Systems, Set work Ar-tecture developers/brion Net-ric Systems, Inc. and the voluntement of fearment BM ex-titive Dan Cases as vice-presided active Dan Cases as vice-presided actives and commu-tion of the community of the community of the com-tractive Dan Cases as vice-presided active Dan Cases as vice-ture and community of the community

NOVEMBER 7, 1988

Now That We've Bought ADR, We Have Just One Thing To Say To Their Clients-And Ours...

Yes. Applied Data Research clients can rest assured that we'll continue to support and enhance the entire ADR product line.

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And these days, the right software combination really helps maximize data processing performance. Isn't that what it's all about? Yes.

SOFTWARE THAT DRIVES THE BUSINESS WORLD.

GOMPUTER ASSOCIATES

# Right on time, sort of

among system plans are right on schedule—almost. the company will likely put off plans for a second Sys-sh-based image system instalation, which had been lated for this quarter, according to Dave Liddell, ger of marketing plans for image application systems for its instalating to its goal of according to the party of the plant of the IM. But IBM is sticking to its goal of announcing general ability for its image systems in the first quarter of 1989, the first MVS/ESA-based pilot project is still scheduled for

coording to Liddell, the two current pilot projects, an MVS flation and System/36 project, are on track. The MVS ect is taking place at the United Services Automobile Assoamiliation and System/Sic protects, are no track. The MSV protects are consistent to the consistent to the system/Sic protects in the Consistent Sic Atlanta for the System/Sic protects are consistent to the consistent to the consistent protects are consistent to the consistent system of protect may recommend to the consistent to the consistent system of protect may be consistent to the consistent to the consistent consistent protects that consistent consistent are consistent as a consistent are consistent to the consistent consistent that the consistent consistent consistent consistent with fact the relatively new image system markets. The exhibition is not in very ambition plants for EMM to the consistent consistent consistent consistent with the consistent consistent consistent consistent with the consistent consistent consistent that the first firms it is a selected. Adultive and they expect EMM to associate the consistent consistent MR to associate the consistent consistent MR to associate the consistent consistent MR to associate to the progress at the plant sites as MR to associate the partners at the plant sites as MR to associate the plant sites as the plant site as MR to associate the partners at the plant sites as MR to associate the plant sites as MR to associate the plant sites as MR to associate the partners at the plant sites as MR to associate the plant sites as MR to associate the plant site as MR to associate the plant sites as MR to a

IBM's Liddell points to the progress at the pilot sites as oof that the company will meet its goals.

ROSEMARY HAMILTON

technical projects manager at Westinghouse Trading Co. in Pittsburgh, Pa., which is a Free-

ed consultancy, claimed that Wang must lower its entry-level price from its current \$1,995 to below the "magic thousand-dol-lar nut." With all the add-ons.

style beta-test site. In the meantime, Wang has In the meantime, Wang has stroduced what analysts have escribed as a teaser. Bart tuck, vice-president at Probe lessarch, a Morristown, N.J.

# Pen, tablet, phone mean ease of use on Freestyle

BY ROBERT MORAN

NEW YORK - Freestyle, Wang NEW YORK — Freestyle, Wing Laboratories, Inc.'s combination of electronic pencil, tablet and telephone handset, may refresh the frequently over-touted ease-of-use feature, analysts and us-ers said following last week's an-

pancement.

By touching a symbol such as stapler or wastebusket icon the an electronic pen, users of reestyle-egoped IBM Perhall Computer AT compatibles in open files and then annotate committee them, ship them other users or leave them in ectronic file baskets.

Rowerser the first release is. cameron claimed the average cost per seat comes to about \$3,500. "That's tos much," be said. "But Wang is trying to cre-ate market value and is discount-ing the heli out of it."

electronic file baskets.

However, the first release is not fully integrated with the Wang Integrated Image System WIIS) or its Office products. decisive edge over Hewlett-Packard Co. in a \$2.7 million contract with Hector & Davis, a estyle only permits users to re information out of a file, otate it and put it back, said motate it and put it ouch, some obert Cameron, vice-president: I Betaquest, Inc. in Bomboro, lass. "It needs both an inter-ce to the entire windows struc-ire in WIIS and the ability to twigate through it," he said. That shortcoming will be liminated in the next release of

large law firm with headquarters in Miami. According to Patricia Cash, the firm's MIS director, Freestyle is much easier to use than HP's New Wave, which was introduced in May but is not scheduled to be available until

The tool did give Wang the

Analysts also anticipate localarea network support in the next

# Cloud over Wang?

IBM could steal show in imaging systems

made a few scores in traditi IBM accounts, but they we not identify those accounts.

not identify those accounts.

Consultants and that even though the traditional large IBM accounts could be the most because of the control of the control of the course, including its own installed base and non-IBM accounts, to get new business. WIIS users from both of those segments contacted last week said they were very estimed with the Wang product.

is year. The system, which only stores 50,000 docu rently stores 50,000 cocu-nts relating to a single anti-st case, supports seven law-s and their assistants. With WIIS, the lawyer types the keywords to search for a

in the keywords to search for a set of documents and pressen one key for the first image to ap-

The American Automobile Association (AAA) just selected Wang after roviewing in vendors. Its WIIS system, now being installed, is intended to manage all documentation on AAA's inspections of hotels, camp-

spectors of notes, camp-grounds and restaurants. Users said one reason for ae-lecting Wang was that its system is available now. "Our need was immediate," said Helen Kelly,

volves looking through millions of 3- by 5-in, index cards in the basement of headquarters. Now a search on WIIS can take seconds, be said.

Many large IBM shops, however, will be relactant to set up supplications willion of the said BY ROSEMARY HAMILTON

In the pre-IBM image systems market, Wang Laboratories, Inc. is having a field day. is having a field day.

In one year's time, the Low-ell, Mass-based company has gone from zero to 120 in number of units sold, and users of its Wang Integrated Image System (WIIS) give the company high

marks.

But new business will not come so easily in another year's time, when IBM is expected to begin image system shipments, consultants said last week.

Consultants noted that Wang has handled itself well with such

has handled staets well with such competitors as Plenus Comput-ers, Inc. and Filenet Corp., both smaller componies that entered the market ahead of Wang. But IBM will bring a new level of competition, especially for those accounts with long-standing

The image systems market began to take off last year when traditional companies such as Wang tossed their hats into the ring according to Steve Eliott, a partner at Arthur Andersen & Co.'s Andersen Consulting divi-sion in St. Louis.

Data Corp. estimates, total mar-ket revenue jumped from \$46 million in 1986 to \$93.4 million

From weeks to seconds
At the headquarters of the
American Red Cross in Washington, D.C., a Wing image system
was recently installed. Approximately 200,000 images in a refugee tracking system have been
entered via a scanner. The images consist of photos, birth certidicates, dispersion representations, dispersion representations. According to Bill Lupinacci,
director of Red Cross headquarters systems and telenomunications, the search for refugee
documentation could take as

documentation could take as long as six weeks because it in-



COMPUTERWORLD

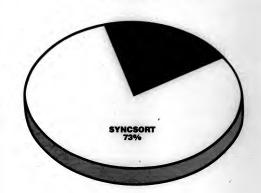
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# SYNCSORT vs. DFSORT

MVS AND MVS/XA SORTS IN USE



Source: International Data Corp

# THE PEOPLE HAVE SPOKEN.

To find out who makes the best sort, ask the people who use sorts.

And when a leading independent research firm asked MVS and MVS/XA users which sort they used, the overwhelming answer ' was SyncSort.

Which just goes to show, when you make the fastest sort, people aren't slow to recognize it. For more information, call (201) 930-8200.



# **NEWS SHORTS**

# Ken the answer man

Ken the onswer man.

"Throw what the first questions is poing to be," said Ken Ohsen, president of Digital Equipment Corp., at the company's middle of Digital Equipment Corp., at the company's middle of Digital Equipment Corp., at the company's middle of Digital Equipment Corp. and ATET, despite recent book excepts stating otherwise. More were A. Ren't buylow to be A templane company and a lower were. A ren't buylow to be A templane company and a lower were A. Ren't buylow to be A templane company and the Corp. (as the Corp. of the

# X/Open investigated

X/Open investigated
Many were shocked last week when it was revealed that an investigation was under very such the the operations of X/Open's
San Francisco office which it was under the directions of former
than analytic guide reflected for the direction of some than the direction of the direction of the direction of the direction
is the through review of operation, including financial imange-ment. Askerman departed from X/Open in late Spensiber,
gringing the explanation that he susted to set this own considerging the explanation that he susted to secondarie guide to the
man of the investigation, which is to be conjected soon.

Playing it safe
Tokyo-based CSK Corp., a major IBM notivare supplier in japan, can see both ideo of a dispute. CSK said but week that it
plans to become a member of the Open Setware Foundation. It
is also reported to be close to pinning the Archer Ground. It
is worked to be close to pinning the Archer Ground. It
is worked to be close to pinning the Archer Ground.
Totalita America, inc., is amenican of both rand groups.

# Sorbus lays off 100

Intense price-cutting in the party maintenance, partially caused by IBM's Corporate Service Amendment, has forced the first layoffs at industry isseless Sorbus, Inc. in response to business conditions. A spokeworms for parent Bell Atlantic Corp, has confirmed that Strone laid off 100 engiphores nationable, mainly field engineers and sales managers, effective Nov. 1. The cuts reduced the Sorbus work force by Josut Corp.

HP chops Vectra prices
Costrary to a trend toward blaming higher prices on increases in the cost of memory, Hewlett-Packard Co. reduced prices on five models of the Vectra ES/PC by 17% and Vectra ES/12 PCs by 7%. The decreases amount to \$400 per model of the ES/Increases amount to \$400 per model of the ES/Increases amount to \$400 per model of the ES/Increases.

# PC software controls eased

The U.S. Department of Commerce last week announced plans The U.S. Department of Commerce last week amounced plans to remove super Controls on mane-marketed microconeputer software packages and simplify other software and technical data seport regulations. Officials and the proposal will make it easier for the software industry to boot exports and will applicate the government to focus its enfourcement efforts on more advanced technology. Public comments are due Nov. 28, and the final regulation is expected in January.

# Just the fax, MCI

AGE TIME TICK, PNC1.

MCI Communications Curp, last week laid claim to the title of being the first U.S. Image finance provider to offer a definated to being the first U.S. Image from the first U.S. Image for the first U.

# Multivendor CIM at Autofact

BY ELISABETH HORWITT

CHICAGO - Like a pack of electoral candidates, major host vendors came to last week'a Aumined to win support for their computer-integrated manufac-turing (CIM) platforms from sys-tems integrators, users and oth-

Responding to a burgeoning demand for tools to facilitate the development of CIM applica tions, various companies un-veiled here what they claimed are "open" software architec-tures that make it easier to manous areas of manufacturing.

The products are said to connect a range of vendors' equip-

manufacturing: bissiness sys-tems running administrative software such as manufacturing software such as manufacturing resource planning; engineering and design workstations; and factory floor devices. The only provise is that the vendor's hard-ware and software platform acts as the focal point.

"Technology backlash"
"Companies have had to custom-ise software (to link different systems), and there was a technology backlash because solutions were two costs!," said An-thony Klemmer, vice-president of sales and marketing at ITP Boston, Inc. What users ward, be added, are vendor-independent added, are vendor-independent application platforms that save them the cost of developing everything from scratch for each new system. ed the following:

Tandem Compu

documentation for its Tanden Integrated Manufacturing Envi-ronment (TIME) platform gen-erally available for the first time to systems integrators, users and software vendors. TIME provides building blocks for de-veloping factory floor control ap-

veloping factory floor control ap-plications, document inter-change and integration with factory minagement systems such as Management Science America, Inc. 'a AMAP.' « IBM announced general sual-ability of specifications for Dis-tributed Application Edition (DAE), a software platform for cell control that will initially run on the IBM Personal System/2 on the IBM Personal System/2 running OS/2 Extended Edition. Continued on page ?

# IBM joins benchmark standards council

BY STANLEY GIBSON

IBM last week cast off part of its proprietary mantle, joining other major hardware and software companies on the Transaction Processing Performance Council (TPC), which seeks to estai

IBM also paid homage to the Debit/Credit standard — to which the TPC's work has thus far been dedicated — by releas-ing an independent auditor's re-port of its Debit/Credit beachmark testing of the 4381 and Enterprise System/9370. The IBM benchmark shows results that are three times greater than those claimed by Digital Equip-ment Corp. when it tested those IBM systems earlier this year.

Despite the disparity be-tween the results, IBM's auditor, Tom Sawyer of the Codd a Date Consulting Group in San Jose, Calif., said the difference

The council met in Mariboro, Mass., last Thursday and Friday to iron out benchmark specifics. It was the 25-member group's could have been related to the implementation of one-tenth the

Omri Serlin, TPC organiser and president of from Interna-tional, Inc. in Los Altos, Calif., said the council has decided to establish both Dehit/Credit and TP1, a Dehit/Credit subset, as standurds. He said the database software vendors that are counsimulates a bank's automate teller network, and think time are the amount of time a telle takes between transact cil members favored the adop-tion of TP1 in the belief that the benchmark isolates the database software, which allows for a takes between transactions. Sawyer speculated that the 100-sec, think time that DEC reportedly used as opposed to the 10-sec, period IBM used might have caused increased I/O to dink on the part of the IBM systems, which would have slowed them down considerable.

Unanswered questions IBM, as a TPC member, could an develop a stan-

Ramp C benchmark. In calculating cost per trans-action, IBM used annual minita-nance charges based on its Cor-porate Service Amendment and Mid-Range System Amendment service discount plans. These of-fer discounts of about 10% to 25% for customers who can as-sume some minitenance respon-sante some minitenance con-traction of the contraction of the con-traction of the contraction of the con-traction of the con-tractio

used a 3725 communications controller, the cost of which was not included in the configuration. Whether it should be is a point on

From the horse's mouth

Results of IBM systems using a proposed Debit/Credit bench
for throughput performance, in earlier comparisons, DEC I
3140,000 per transaction per second d Debit/Credit benchmark show relatively low five-year cost. comparisons, DEC had cited the IBM 9377-90 at more than

system, which was used by both IBM and DEC, has a 16M-byte limit, which would prevent additional memory from alleviating the problem, Sawyer said. Sawyer said be could not cov-

the problem, sawyer said.

Sawyer said be could not comment fully on DEC's results because it has not released a full report with details of its testing procedures. DEC said in July that

9375-50	16M	8	1,190	7.5	\$33,900
9377-80	16M	8	1,400	13.2	\$27,000
9377-90	16M	8	1,800	17.1	\$28,800
4381-P22	16M	10	2,400	22.1	\$35,200
					SOURCE O

# **Autofact focus: Workstations**

CHICAGO — Traditionally a showcase for mixed-vendor connectivity through the Manufacturing Automation Protocol and Technical and Office Protocol, Autofact served as a showcase for new levels of price/performance in workstation hard-

price/performance in workstauou naru-ware here last week.

Even Apple Computer, Inc. got into the act, with Chief Executive Officer John Sculley promoting the concept of Macin-toshes in data collectors on the factory

"We have 200,000 Macinton "We have 200,000 Macintoshes in technical markets. It's the fastest growing market we have in the work!, "Scalley and in his lesponte address. Apple uses Macs and Tandem Computers, Inc. processors to run its own factories, he said. The synergy between computer-inference of the synergy between computer-inference of the processors to run development computer-inference of the synergy between computer-inferen

# Multivendor

CONTINUED FROM PAGE 6

IBM also announced the names of more than 30 Plant Operations Business more than 30 Pint Operations Business Partners that are planning to make their applications available on the DAE plat-form by early nearly very. IBM stail.

\* Two CIM platforms at the show were the product of wender alliances. Fyramid from Digital Equipment Corp. and Allen-Breadly Co. and Strause CT, from Strause CT, Computer, Inc. and Mosterois, Inc. subsidiary Mosterois Loughers X, Inc. and Strause CT, Device Interface System, a tool for devul-cening factor device control annolactions.

Device Interface System, a tool for devel-oping factory device control applications. This is the latest addition to the HP-In-dustrial Precision Tool indivare develop-ment environment, which provides "starting blocks for folks that want to roll their own CIDM Soctware," and HP Prod-uct Manager Jane Forster. The first of these, announced last July is a memory-resident database management system. HP visus to amongene the HP interactive resident database management system. HP plans to announce the HP Interactive Visual Interface, a comm face based on the X Windo year send, Forster said.

face based on the X Windown standard, by your level, Powerle and Section 2002 of the Control of the Control of the Control of the Section of all the devices they magity want on the Control of the Section of the Secti

Olsen described DEC's leverage of its srnai 120,000-user Decaet as essen-in reducing research and development tial in reducing research and development costs. "We design complex integrated circuits in Ierael, and we do simulations in Hostoco, Mass.," the explained. "Because our network is homogeneous and earniess around the world, these two groups feel they work in Jadjacest) buildings instead of 7,000 miles apart."

When the Ieraelis finish a chip design, they mail the chip to Manaschasetts, Oi-

sen said, and then "watch the test results on screen as they are being carried out in

porations smaller than the \$2 bil-pple or the \$11.5 billion DEC can or az bino benefit from new price/performance
rels set at the show. Among these was a
,000 Schamber ger Technologies, inc.
ciatosh II package called Machravo,
ich Apple claims can provide funsimilar to the

maximum II packing cases Machravo, which Apple claims can provide functionality similar to that of a Sun Microsystems, Inc. low-end workstation. Both the Mac II and the Sun system are based on the Motorolo, Inc. 68020 chip.

Other highlights of the show included

the following:

• Apollo Computer, Inc. in Chr. ss., introduced a rack-mou

stations. The Apollo DN3540, based on a 25-MHz Motorola 68030 processor, is priced at about \$8,500.

 DEC in Mar tes an IBM 5080 ophics workstation running on a start Vaxstation. The software support ely installed graph

# IAM vs VSA

# The Incredible Shrinking Machine

VSAM

IAM

AM

IAM Reduces the Size of Your VSAM Files by 30 to 70%

# IAM FILE STRUCTURE

IAM uses an advanced file structure which is to appairs to VSAM. IAM's supercompressed incles requires a finalism of the space latest by VSAM IAM's threepeds concepts make much more affi-cient use of disk space. IAM's blooklesses are not restricted as VSAM's are, making full utilization of each track. IAM's not afficiated by large latey sizes which can result in VSAM wasting CI's in the property of the control of the contro

# DATA COMPRESSION

SAVES AN ADDITIONAL 20 to 50% DASD SPACE

optionally compresses data records. Mor contain records with unused fields or re ling sets of characters. When IAM applie mortatery compression techniques, the re

Mrs CPU time is d peting compression pr IAM's CPU time is nor

AUTOMATIC RELEASE OF UNUSED SPACE

# TRANSPARENT

VSAM files account for the lion's share of disk space used in most installations. Online systems (CKS), BATCH jobs, TSO, SMPE and other applications make extensive use of layed index VSAM (KSDS) files.

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7

# **AT&T** wins \$929M Air Force slugfest

Talk about customer clout. Comtion was so intense for the sted U.S. Air Force contract coveted U.S. Air Force contract, for 20,000 Unix multisuser sys-tems that the winning bid from AT&T was 70% chesper than the government expected. The Air Force initially esti-

mated a contract value of \$3.5 billion, but AT&T's low bid came in at \$929 million for one of the ntracts ever awarded. The bid included AT&T's

32/600 minicomputers, a vari iop of AT&T's 6386 graphic orkstation, the Unix System V erating system, Unity Corp.'s em and development tool Venturcom, Inc.'s Prelude

ann vesturcom, inc.'s Prelude office automation software. Robert M. Kavner, president of AT&T's Data Systems Group, said that all the vendors took into consideration technology im-provements and cost reductions cted over the term of the

"With this kind of competi-tion, it's going to be hard for any-one to look back and say the gov-eroment got a bad deal." he said.

stalled by the end of this year. MCA-based Personal System/2s will dominate 1969 personal computer purchases at Fortune 1,000 sites, according to Com-puter Intelligence Co.'s Tom

Supporters of the EISA bus, nawhile, claimed that cus-ner demand exists for an al-native to IBM, although none uild cite statistics or figures to all cite statistics or figures to ters of the EISA bus.

ir would any or the EISA inders acknowledge what riket situation would have to st to make the MCA the 32-bus standard or what would impt them to enter the Micro

Channel market.

IBM said that three million
PS/2a had been sold by the end of
September. IBM also indicated
that half of those sales included
the MCA. It hast week also refuted speculation that its licensing
fees for Micro Channel utility

ents were preventing maker compatibles from entering the

inte that statement.

Surge FROM PAGE 1



AT&T's rocky start in the

puter business behind it. However, the real signifi-cance may be AT&T's coming into its own as a major player in the lucrative system integration lity, the contract breaks out to

ity, the contract breaks out to approximately 60% software of which operating software counts for a minimal portion — and 40% hardware, according to Gig Graham, director of software services at The Gartner Group, fire. In Statesford, Conn.

With this award, Graham, which is a sward, Graham, and the services are positioned as the services of the ser tems Division. In the past, AT&T has relied on partner Electronic Data Systems Corp

A Digital Equipment Corp. spokesman said that if IBM were to drop the MCA fee, DEC would to drop the MCA fee, DEC would consider selling a PS/2 clone. Last mooth, DEC said it had no plane to sell a Micro Channel clone, and Tandy Corp., which has an MCA licensing arrange-ment with IBM, agreed to let DEC resell its PCa. "We aren't (that) wedded to EESA." the

# [that] wedded to EISA," the DEC spokesman said. "We will entertain embracing the Micr ACA slew to go

EISA members unanimously said they are developing MCA prod-ucts, but aside from Tandy. which has already released such a system, only Ing. C. Olivetti & Co. has announced plans to re-lease such an MCA product. They can sell as many Micro

They can sell as many Micro
Channel machines as they
want," said Wyse Technology's
PC marketing manager, Chris
Kryzan. "I don't think I have any
crack at those machines' crack at those machines' [sales]." Kryzan said customers are buying MCA machines because of IBM's solid reputation

for product service and support.

But Epson America, Inc.

Vice-President Steve Lapinski
said that MCA market share is
still up for grabe. Although be acknowledged that an MCA mar-

to win many of its contracts.

AT&T won out over five other big-league vendors: IBM's Federal Systems Division; Zenith Data Systems Corp. (with Hewlett-Packard Co. as its sub-contractor); Honeywell Federal

contractor), Honeywell Federal Systems; Planning Research Corp. (with NCR Corp.); and Lockheed Corp. (with Counter-point Computers, Inc.). The initial contract lasts two years, but the government can extend it to five for hardware and training and eight for soft-ware, maintenance and support.

# A big to-de Andrew E. Bilinski, the Air Force's deputy assistant secre-ture for command, control, com-

munications and computer sys-tems, noted that the Air Force 251 was "one of the most con-

in history."

The controversy over the openness of the Unix operating system began last year when Digital Equipment Corp. and Mang Laboratories, Inc. protected the AFCAC request for proposals, saying that it favorable posals, by the Mang Laboratories of the mented age.

but a recerus contract appears bourd rejected the protest, asy-ing that the Unix System V In-terface Definition is freely is-censed to other vendors and the Air Force had a legitimate inter-est in software portability [CW, Oct. 26, 1987]. Both DEC and Wang latter withdrew from the competition.

ket exists and that IBM has in dated its distribution chann

dated its distribution channels be minitarized that close ven-dors can underprice IBM's MCA products if they choose to. "I feel history will repest it-self," Lapinski said. "We've all been underneath IBM's fiscens-ingl clouk and dagger before and their commencement. their compression of pricing. We'll respond with [price/perfor-

But IBM has no intention of allowing such an event to occur. It has been 19 mooths since IBM first introduced the Micro IBM first introduced the Micro IBM streemedous advantage in facturing its manufacturing techniques. As the only MCA vendor, IBM has the product's distribution charmels well under continue. The EISA technical specification is not seemed first techniques and the continues of the IBM seemed in the IBM seemed in the IBM seemed in the IBM seemed in the IBM seemed IBM

tion is not yet complete. But EISA vendors insisted that it is now possible to begin technical development on machine the specification. The corn EISA technical specificati be distributed at Comd

be distributed at Comdex/Pail
'88 this week at Microsoft's Pro-sentation Manager announce-ment in New York, Entry Sys-tems Division President William Lowe said IBM would make a about the MCA at COMPUTERWORLD

# Unix rift continues

Users see AT&T with edge over OSF renegades

claimed Unix System V is a prod-uct today and that many manu-facturers, software vendors and their customers have made sig-BY AMY CORTESE

At last week's Unix Expo in New York, there was evidence that momentum in the AT&T/Dpon Software Foundation (OSF) hat-the has shifted to AT&T. Many users attending the show claimed they were not co-cerned with the debate over the Unix learnel, but they tended to believe AT&T will prevail. Echoing many users' res-tions, Russell Kenaedy, an infor-mation systems executive at

The ISS counter of the Issue of passing the Issue of Issu mation systems executive at General Foots Corp., said that AT&T will hold firm because of its installed base. He added that stick with AT&T's Unix System V, characterising IBMs as a start-up in the Unix areas.

For a start-up, however, IBM stole the show. Its measure network, composed of a 5090 connected to a 4881 and myriad worksetsions, all running AIX, was a show unto itself — and was heavily attended by watchmen. be a superior product, Kavner vehemently denied it.

First this way, then that While praising AIX one mome the OSF is ambiguous the ne foundation is ready to use both Unix System V and AIX. "There are some features of System V we would love to have," O'Shes nen.
It is rumored that the display cost IBM upward of \$2 million, Most attendees said they were impressed by IBM's show of commitment to AIX, although

communement to AIX, although some expressed cyniciam.

One of the cynica was Robert Kruer, president of AT&T's Data Systems Group, who gave his opinion during a press briefing Tuenday, Kavner and IBM's hage display demonstrated the Measwhile, Kavier his re-jected any compromise on a base operating system other than System 5. He claims that by starting with a new kernel, OSP has a fundamental point of depar-ture from the market. Kavner offered one scenario

Kavner offered one at has been heard with increase wordy. "There's no rea "here can" hage display demonstrated the company's commistenest to AIX, but be added that AIX is a proprietary version of Unix not incensed to other vendors.

"If you buy as AIX product and stay within the IBM family, then you're in good shape," he maid. "But that's not what the rest of that floor stands for."

ATAT and its supporters still that has been many "There's no res-ing frequency. "There's no res-son," be said, "that there cen't be two implementations of Unix, with X/Open or Posix interfaces

Nevertheless, the unrelent-ing debate over the Unix kernel does not seem to be stalling user esthusiasm. The "It's OK to say the U— word" buttons that many attendees were seen





# **DPMA** targets non-MIS

BY JAMES CONNOLLY

DALLAS - The Data Proce agement Association (DPMA) outlined plans last week for an attempt to broaden

ers at the association's annual meeting ere said the 1989 conference in Toronto

managing a four- to eight-user personal computer network.

Acknowledging that attendance last week was disappointing and slightly less than the turnout for the 1987 meeting, DPMA President Christian G. Meyer said the association hopes for increased non

MIS and vendor participation.

"The show was a modest succe dance was down from last year, but the show was well-executed and the speakers cellent," Meyer said. "Next year, we are changing our emphasis. The mar-ket tells us we need to be more specific in our program."

John Hobbs, the DPMA's 1989 general conference chairman, explained that the association plans to offer a series of

inches with the control of the contr

Meyer also said that the DPMA will

from another computer show being held in Toronto shortly after the 1989 confer-ence. He said that the DPMA hopes to feature other types of vendor participa-tion by recruiting vendors to sponsor spe-cific assirons and arrests.

Several attendees said they looked for ward to increased vendor participation particularly if it means that m such as IBM will provide

# Cray-2 gets memory boost

BY JEAN S. BOZMAN

MINNEAPOLIS - Cray Research, Inc. ounced a \$17 million extended-me

announced a \$17 million extended-memo-ry version of its Cray-2 supercomputer last week that it sold provides 30% great-er throughput than earlier Cray-2 models. Cray said that it plans to ship the first Cray-2/512 to Minnesota Supercomputer Center, Inc., a supercomputer service bureau affiliated with the University of Min-nesota. The new machine, which doubles the memory of the 256M-word Cray-2, will join three other supercomputers at will join three other supercomputers at the center: a Cray-2, a Control Data Corp. Cyber 205 — both purchased in 1985 — and a brand-new four-processor CDC ETA-10 liquid nitrogen-cooled supercom-

The latest Cray is slated to arrive early December and will eventually dis-place the Minnesota Supercomputer Cen-ter's older Cray-2, center President John Sell said. The center plans to lease the new system while awaiting the 1990 or 1991 shipment of the Cray-3, he said. "We already had the largest computer

they made, and we were beginning to see that 256M-word memory as a limiting factor," Sell said. "We went to Cray a year ago to ask for a machine with more memory. Now, Cray will sell the Cray-2/4-512 as an official product that will serve the needs of other clients."

The Cray-2/4-512 supports 512 mil-lion 64-bit words, or 4.3G bytes, of directy addressable main memory. Its CPU uses 1M bit of dynamic random-access memory (DRAM) chips, in contrast with the Cray-2's 256K-bit DRAMs. The new se's chips have an average access ne of 80 nsec, compared with an access me of 120 nsec for the original Cray-2. o reduce jumps from buffer memory, the Cray-2's instruction buffer capacity has ed to 32 64 Juit more

d then there were five ere are now five Cray-2 models — two sed on DRAMs and three based on oldranges from \$12 million to \$17.5 million.
Sell said his center serves the computing needs of many universities and many Fortune 1,000 firms experimenting with

supercomputer applications.

The pace of technology is pushing what once were powerful supercomputers out the door of the supercomputer center. One outdated Cray-1 is literally sitting in the center's lobby, Sell said, and d as guest seating for the m "We think all supercomputers are interim machines," he said. "There's no such

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IBM. The Bigger Picture

# Bus wars behind the curtain at Comdex

# BY WILLIAM BRANDEL

Just when you thought you had escaped the political jockeying, hyperbole, polling and caucus decisions and were ready to get down to some cut-and-dried tangible

But unlike this year's election, there is

But unlike this year's election, there is an issue at stake, and steps will be taken at Camdest to resolve it.

Taking a page out of 'yesteryear's smoke-filled caucus room, personal computing's latest the filled manura par be olived position of the contraction of the contraction

Tolly belly-hoo
According to those in the know, many
BMR Personal Computer clone vendors
will not showcase their leading-edge
products, the Personal Systems 2 clones,
on the showroom floor. Many are voicing
support for the Extended Industry Standard Architecture (EISA), announced in
September. And it is off the showroom
floor where their reportedly intend to tally r where they reportedly inte ballots for the MCA.

the ballots for the MCA.
"You'll see quite a few MCA products," said John Dunke, vice-president of
the Aberdeen Group, a market rosearch
firm located in Boston. "The interesting
point will be whether the EISA founders

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"None of the PC products, whether PS/2 or EISA, have made a mark yet," Dunkle said. "And so it will be something like 'There's the flag; who saluted?' It won't be until next Comdex that the real

product lines will come out."
"The personal computing market is leery about its future." said Howard Cohen, product marketing manager at San Jose, Calif.-based Chips and Technologies, Inc., an BIM BIOS code and chip-set provider for both BIM PC AT- and MCA-compatible computers. "With the cloud of BISA hanging over people, Code will actually be a bod time to show offer will actually be a bod time to show of product lines will come out."

new technologies. Everyone's working or a PS/2 clone. But at the same time, people

a FS/2 clone. But at the sume time, people are not committing to saything.

Cohen agrees that the show's main theme will be secrecy, and it will test the market acceptance of certain PC technologies. He estimates that between 10 and 20 FS/2 clones will be in Law Yegand uring condex, atthough only a small percentage will make it to the show floor.

But some analysts believe that this Condex will pick up where the last one left off.

"If there aren't applications for Pre-sentation Manager, then I don't know

what will be at Comdex," said Dick Shaffer, president of Technologic Part-nera. "That' a the whole point of this Com-dex. — to get Presentation Manager out after OS/2 and before OS/2 Extended Edi-

after Usy2 Bas vanue. De la Company de la Co





# PC options aplenty at show

Graphics, security features woo attendees

BY SALLY CUSACK

Vendors at this week's Comdex/Fall '88 will be wooing PC users with promises of graphics options, expansion capabilities and enhanced security features. Some of the expected rollouts include the follow-

A hardware and software product developed specifically to design and execute business presentations is scheduled to be

sonal Computer AT-based system report-edly captures video images in real-time mode from standard video cameras and vitte recorders. The images are then integrated with text and graphics to create visual output for use in sales and marketing presentations, training materials and other applications. According to the vendor, the system accepts industry-standard image file formats as well as AS-CII files from word processors and graph files from Lotus Development Corp.'s 1-23 according to the control of th

Calif., is set to display a prototype of its MPC4000, a file server and multiuser host with memory expansion capabilities. The tower-form Intel Corp. 80386-based machine incorporates a 25-MHz CPU and

vices.
The company said it will also introduce
Intel 80386SX-based computer demeter to compete directly with Company
importer Corp. 's 386 machines. Dubbed
MPC2386, the product incorporates the MPC2386, the product incorporates a 16-bit data bus and six expansion slots. The unit is expandable to 16M bytes of on-board memory with room for four storage devices, the vendor said. IBM Video Graphics Array (VGA) graphics are included with the motherboard. gradable to support the emerging 1,024 by 768-pixel super-extended VGA resolu-tion, the vendor said. The product report

An 1-5 in. COST multicast monitor for IBM Personal System/Ib and Apple Computer, Inc. Machinoth III will reportedly be IBM Personal System/Ib and Apple Computer, Ibc. Machinoth III will reportedly be IBM 1992. White Ibm 1992 in Ibm 19

Designed specifically for the PSQ, the ACL-MC institutes everils board features 1280. To have no buffer random-access and to be fully compatible with IBM's Micro Channel Architecture, and it can be configured to sold four or eight channels to ningle PC expansion shot. In the PC companion shot and the PC companion should be provided to the PC companion sh

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# Mid-ranges, peripherals share stage

e personal computers steal er stage on the show floor year, mid-range computer peripheral vendors should be to hold their own with a lier — but nonetheless

computer systems family. The CIES 680/750 is reported to be a 512-user supermicrocomputer 512-user supermicrocomputer that combines advanced CPU, memory and disk technology with a proprietary version of the Pick Systems Pick Operating

68030 microprocessor and dualbus architecture. It can support bus architecture. It can support up to 66M bytes of random-ac-cess memory and 48M bytes of disk-cache space, the vendor said. The base configuration is shipped with CIES Pick Version

7.0. Headquartered in Irvine, Calif., CIE Systems is a subsid-iary of C. Itoh Electronica, Inc. • MCBA, Inc., in Glendale, Calif., is scheduled to display its turing software for Unix-based

order processing and in The system is written in Ryan McFarland Corp.'s RM Cobol 85

and runs in several Unix and Xenix environments, including IBM Personal Computer ATs and compatibles under The San-ta Cruz Operation's SCO Xenix, NCR Corp.'s Tower series under Unix and Altos Computer Systems, Inc. systems under Alto

Mixtope Business Products, Inc. is slated to amounce two nonimpact ion-deposition page printers designed for mid-range computer users. Printing appli-cation environments include IBM's Systems Network Archi-

Miltope's Series 30M is a 30 page/mio, cut-sheet paper print-er that includes two 500-sheet input feeders and two output bins. The Series 37 offers a 37 page/min, continuous fanfold output and features a powered stacker.

Both units reportedly provide etter-quality printouts at 300 by 100 dot/in. and are rated at monthly volumes of up to 250,000 pages. The company is based in Melville, N.Y. · Sunriver Corp. will introduce

\*Sunriver Corp. will introduce an 800- by 600-pixel 16-color IBM Video Graphics Array ver-sion of its Fiber Optic Station. Developed for computer-aided design (CAD) environments, the product is especially suitable for

product is especially suitable for manufacturing, engineering and desktop publishing work groups, according to the vendor. The Jaciston, Miss-based company will also demonstrate a variety of CAD, desktop publishing and office automation prod-ucts running under several mul-tiater DOS, Unix and Xenix constitutes and the production of the con-traction of the constant of the con-traction of the con-

tuser DOS, Unix and Xenix operating systems.

Plasmon Data Systems, Inc. in San Jose, Calif., is set to announce 200M- and 400M-byte optical media offering compatibility with the Wang 47 GB auto-

The storage devices w ed for organia data is stored on the optical me-dia, it cannot be accidently or

tal Equipment Corp. VAXs will reportedly be unveiled by Centu-ry Data Systems, Inc. in Ansim, Calif. The DS21200 and 22400 of

The DS21200 and 22400 of fer 900M bytes and 1.8G bytes of formatted capacity, respec-tively. The storage devices re-portedly offer 100% compatibi-ity with DEC's Unibus, Q-bus, HSC50/70 cluster controllers SALLY CUSACK

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# Tandem adds multiple CPUs

BY L. A. SAVAGE

CUPERTINO, Calif. — Giving users more room to grow with memory, Tan-Computers, Inc. is set to introduce my four high-end configurations of its astop VLX mainframe with four to 32 processors. The firm also added two en-try-level VLX configurations, main-mem-ory modules and a disk-storage facility. "The enhanced productivity will help

convince people they don't need an IBM 3090 in order to grow," said Sandra Gant, an analyst at Santa Clara, Calif.-based Infocorp. Gant said users are beginning to accept that the company is moving out of its fault-tolerant niche and into general computing, running into the big players like IBM and Digital Equipment Corp. The new configurations replace seven older models, which means the company

is dropping the three- and 24-processor models. The top of the line is still the 32processor model, the primary difference being increased main memory — up 256M to 512M bytes — and increased disk-drive capacity — from 24 to 32

One of the four high-end models is the firm's Guardian proprietary operating priced at \$20,000 apiece.

with Jandem's maintrames. The entry-level processors are less expensive than the older models, and the high-end mod-els, including the operating system, are more costly. New main-memory modules are available in 16M, 24M and 48M bytes

are available in 16M, 24M and 48M bytes using dystamic random-access meaning dystamic random-access meaning chips. The modulate cost \$84,500. \$75,000 and \$115,000. respectively. A disk facility, called XLS0, stores \$7,000 and \$115,000. respectively. A disk facility, called XLS0, stores \$7,000 and \$1,000 and \$1,000

# Arthur Andersen sues consultants who jumped ship

BY CLINTON WILDER

NEW YORK — The simmering dispute between Arthur Andersen & Co. and its former information systems consultants erupted in court last week when Ander-sen filed suit against the defectors for a host of alleged offenses, including em-ployee raising, theft of trade secrets and

client inserference.

The sair, filled in New York State Co-prene Court, same eight former Ander-ted Court, same eight former Ander-ted Court, and court for Ander-ted Court former and the Court former complexing them. Anders of the Inde-ted Court former of the Inde-matica Counsilier Court, for. a spin-off consultancy bearbreid by Saich & Sair-ch and Court former of the Inde-counting Yearth of the Inde-counting Yearth of the Inde-counting Yearth of the Index of the Index (Court for Index of the Index of the Index (Court for Index of the Index of the Index (Court for Index of the Index of the Index (Court for Index of the Index of the Index (Court for Index of the Index of the Index of the Index (Court for Index of the Index of the Index of the Index (Court for Index of the Index of the Index of the Index (Court for Index of the Index of the Index of the Index of the Index (Court for Index of the Index of the Index of the Index of the Index (Court for Index of the Index Oct. 31].

Oct. 31.

Andersen has accused the defendants of a conspiracy to operer the Chicago-based Big Eight firm to sell its MIS consulting practice, recently renamed Andersen Consulting, to Santchi & Santchi. sen Consutting, to Saatchi & Saatchi, Andersen rejected both a 1985 offer from the London-based firm to buy the practice and a subsequent proposal by the former head of its worldwide practice, Victor E. Millar, to sell or spin off the Andersen sulting bus

consulting business.

Andersen is the second Big Eight firm to go to court this year to fight departed information systems consoliting partners.

Arthur Young & Co. sand the five top partners in its Midwest practice after they left to form a Chicago-based competitor, Technology Solutions Co. Technology Solutions later counterstead [CW,

Big stokes Both disputes illustrate the explosive ten-sions building within the once-stiid audit-ing firms over the fast-growing and lucra-tive field of information technology

consume.

"Their consulting is becoming almost as big as [their] suditing, and some consulting partners feel underpaid," said David Lord, managing editor of Consultents Ness. a trade publication in Pitzwilliam, N H "Information." segment in management consulting."

According to Lord, several of the for

Lord side the encourage in that Andersea, by far the large file gight player in MIS consulting, would perceive such a competitive thereal from its flormer period in the competitive thereal from its flormer period to that the fiftent would not bert them. In the competitive the control of the competitive the control of the competitive that the competitive that the competitive that the control of the control of the competitive that the control of the cont



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# **EDITORIAL** No real choice

OMPUTERWORLD HAD INTENDED to break with tradition this year and en-dorse a presidential candidate. Unfortunately, the vacuousness of the campaign, the ideological hysteria being used to divide the nation and, less significantly, the location of our main office in the state governed by one of the candidates force us to sit this one out.

We can, however, present an agenda of information issues the next president must deal with. They will not be easily addressed in a sound bite. . Productivity. Computers are tools for regaining momentum, both in the factory and the office. The government can lead by targeting the federal bureaucracy as a model for computerization and requiring contractors to follow interna-tional communications and software standards.

• International trade. To bring the trade deficit down, we must sell more products abroad, not limit imports. It is imperative that we grab the lead role in emerging technologies and awak-en dormant markets for our expertise.

. Aid to small business. Corporate megamergers are draining investment dollars out of the venture capital pools. We cannot shut out small companies, the foundation of this industry. · Privacy. It is only a matter of time until the Supreme Court deals with the issue of who has access to the vast stores of electronic information that public and private agencies have collected about individuals. What principles will the

Industrial competitiveness. Protective trade barriers should be used as a persuasive tactic to encourage other countries to open their markets, not as a cocoon in which to wrap industries that cannot compete globally.

 Education. The most critical problem facing the U.S.'s technological future is the loss of our edge in science and mathematics. We must lead in the application of computers to the classroom and in innovations in technical education.

From our Massachusetts base, we have seen that Michael Dukakis has the ability to converse with executives in the computer industry, and he has been a force in fostering a pro-business at-mosphere in the state. Unfortunately, be has been unable to say how he would extend the "Massachusetts Miracle" to the nation.

George Bush is riding the wave of good feelngs that accompanies the economic expansion of the past few years, but we have grave reservations about his decision to relegate the nation's staggering debt to the backwaters of political exency. We are also concerned about the current administration's apparent lack of concern about a financial industry in which paper wealth plays a predominant role at the expense of creation of material goods.

We have viewed this campaign with dismay. Neither man seems to have the ability or willingness to take an issue by the horns and lead the nation to address it. We can only urge you to vote your best guess on which of these two men seems best prepared to deal with reality at some point in the future.

# LETTERS TO THE EDITOR

This week

in history

Nov. 7, 1983

Analysts yawn as IBM's long-awaited "Peanut" comes out of its shell as the PCjr. Major

criticisms center on lack of sufficient memory for serious

total compatibility between the PCir version of PC-DOS

and applications written for Release 2.0 and 2.1 and a

# Still a man's world

I found it interesting that your list of MIS executives with the ist of MIS executives with the Computerworld Premier 100 companies underscores the glass-ceiling trend identified in your review of The Best Compu-nies for Women by Buila Zeitz [CW, Sept. 12].

Of the MIS executives with the Premier 100 companies, 96% are men and only 4% are women Of those 96 male MIS executives, 56 had the title of vice-president. There were no women MIS executives with the title of VP; all the women held the generally lesser paid titl

director or manager.

Although women may have a relatively easier time entering relatively easier time entering the MIS field, I suspect women MIS executives still earn the national average of 61 cents for every dollar that men make. Karen Ashmore Dallas, Texas

# Mobile solution

sternorld readers and W. Computerworld readers and W. Frank King (CW, Oct. 17) should be aware that there already are portable products that run where Lotus' 1-2-3 is attempting to. Time Intelligence, a mul-tidimensional financial database system from Thorn EMI Comouter Software, became avai able April 1 and runs on VAX/VMS, VM, MVS, Wang VS, DOS, OS/2 and Unix, pro-

viding identical functionality un-der all environments. This was achieved through the sin source software technology de-scribed in the ADAPSO paper Portable Software Products John L. Kopck Pres

the moment at which the jump occurs must be correspondingly uncertain. We can shorten the Your In Depth article "Quantum computing" [CW, Oct. 10] sug-gests the theoretical possibility of infinitely fast switches. This interval of uncertainty but only by blurring the energy levels. As the levels get too blurry, our of infinitely tast switches. I me suggestion is based on the au-thor's explanation that a quan-tum system that assumes one of two states jamps between them instantaneously. Unfortunately, this is not entirely right. measurements can no longer re-liably distinguish between the two states. Thus, the faster the switch, the less reliable our destion of its state is. Nev Because the energy of the two states is pretty well defined.

I'd be very interested in the author's comments, particularly a confirmation that his 150 tril ure remains realistic. And, if so, when might such a machine be available? I know he says "specu-lation is risky," but perhaps if

his article . . . John Forhesh rhosh Associates Jersey City, N. J. Who needs race?

# Nov. 6, 1978 It is an affair like no other— the "Walt Disney Affair"— is which the Department of Housing and Urban Developmen's (HUD) supposedly safeguarded IBM 7074 issues Donald Duck a \$99,900 pay-

In a country that is trying to cor-rect the wrongs of bigotry and prejudice, it seems strange to me to hear of a professional group, Black Data Processing Asso-Check.

The General Accounting
Office was investigating possible abuses in federal overtime pay when it added Don
ald and 29 other cartoon
characters' names to the cistes, oriented solely by race [CW, Sept. 26] It would be [CW, Sept. 26]. It would be inter ceting to know what the benefit are to have such a group, I would HUD payroll as part of an auope in today's world

sterworld seelcos ments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Compou Lawris, Easter, Compt wid. P.O. Box 9171, 375 C

# Of change and the tortoise



From those who scoffed at the idea of silicon slices replacing vacuum tubes to those who snickered at personal computers as toys, new ideas oftentimes face an incredible barrier to overcome before they are

But as we all know, accep-tasce finally arrives and then the technology is promoted on its own red carpet — at least until the next technology takes its

Live or die There is, however, a transition phase during which a technology st prove itself — either live

ist writes and consults on artifi cial antelligence and other advanced high technology topics from his office in Scottadale, Aria.

with GM's announcements for the ill-starred Saturn project, a factory of the future designed to ske vehicles more efficiently an ever before. Yet, the very decision to im-

lement new and advanced tech ology was marred by the deci-

Rammed down throats Instead of letting the technol-ogy emerge, evolve and oth-erwise take root throughout the company, certain levels of administration rammed it down the throat of those critical to its future success. Even milk chocolate can taste pretty awful if it is being jummed into vour mouth.

to your mouth.

into your mouth.

The company said, "Here's the plan. Do it. Don't argue." It expected to create a successful and fruifful environment overnight that started from scratch with leading technology. Talk about burning your bridges.

As we know, the Saturn project, has been successful. ect has been v-e-r-y s-l-o-w to get off the ground.

other words, a programming

You'll forgive me if I say that I and your somewhat artistic re-

direction of our attention away from the bug and toward what happened as a result of it a bit

many successful projects — ev-erything from artificial intelli-



the heat first — a programmer. I've never heard of a scientist who, after formulating a solution that failed, had the nerve to step

You smid, "Attempts to restablish consection were being made throughout September. We continued it this way while there was the slightest chance that in a condition of unguided rotation, the solar batteries would massage to find the sun themselvens. In the long run, the reserve of energy had become so small that the satellite was no longer able to falfill any command or respond to anything. mand or respond to anything, even the most powerful radio messages from earth."

leged programming-bug cause of Phobos-I's failure. After I had time to reconsid-er, I decided to write you this let-

er, I decided to write you this let-ter to proteet your assignment of Phobos-Ta fade-out to a pro-gramming bug without your pre-enting more evidence to us. In writing, I hope to strike a blow on behalf of all program-mers everywhere who are un-reasonably blamed when anyng goes wrong in scientific

Public pronouncements ac-cusing programmers of causing great disasters in research have great disasters in research have encouraged a lot of resentment to be directed toward them, es-pecially by people who haven't the slightist idea of what doing the research entails, including

se who allot the rubles to do

g these technologies instead of isting them on unwilling devel-ers and users. It is the ap-

ed or abused.
For instance, GM has de-oyed two successfully complet-expert systems into the ranks

over the last year.

The first, named Charley, is a diagnostic system that performs preventative maintenance on machinery in its production

plants.
The second is the GMAC
Crofit Advisor, which has been
installed in the headered of
fices nationwide that are part of
the GMAC Loss and leasions about financial applications from buyers of GM
products.
Developed must the last fu-

Developed over the last few ears, these two systems have hown GM that slow and easy

shown GM that slow and easy wins the race.

In fact, the company has seen that such a methodology works much better than dring helter-sieller into a new and largely up proven technology. Thus, it has exaded back its expert systems work by almost one-third to con-centrate on specific areas in which it believes this technology.

Not everyone, Com

atteries were on good in the irst place, that the solar panels ell off on inusch or that a myriad

I suppose, Comrade, you were encouraged to use the missing-control-character excuse by its historic success in explaining monumental failures in America, Evgland, Prance, Jepon and other scientifically developed countries.

"Not to worry," you reassured us. "Phobos-II, a compan-

This approach is in contrast with two years ago, when GM was attempting to develop doz-ens and dozens of expert sys-

Done with mirrors Interestingly, this approach mir-rors the growth of PCe is MIS,

As programmers and hackers started bringing their PCs to work to help facilitate their own work, department managers were faced with a bewildering

to putting toy computers in the organizations, which were do cated to the well-being of mini-

ion probe, duplicates just about all the experiments Phobos-I was to make, and it is not dead." We admire your foresight in sending up a duplicate probe. And we hope that the bug, if there ever was one, that led to Phobos-I'a lonely death was not Not everyone, Comrade, be-lieves your version of what happlicated too — though we as me the two crafts, were run-ing on the same software at the se of their launches, five days pened. We know you were trying to save your own nack by laying the responsibility for Phobos-I's the responsibility for Phobos-1's failure on an innocent programmer. Who can blame you? Better to take on a single programmer than the whole Soviet military-industrial complex, which does not look kindly on having its

apart.
And we admire the frank way
you told the press about PhobosI's deep freeze. We see in it sign of your government's new
commitment to gleatinest.
But, the spirit of gleatinest demands correct content as well as

fell off on insuch or that a myrase of other nonprogram-related things could have taken place never crossed your lips. Instead, you inolated one missing character in a program as the definitive cause, and then

tor is a computer program, but I hope not.

If it did, this matter gives me grave concern for our future—
property of the prop CHARLES P. LECHT

# An open letter written to Comrade Sagdeyev

Comrade Roald Sagdeyev Director General ace Research, Moscow

Dear Comrade Sagdeyev:

Your Phobos-I foible is so cole sal that it might be the single largest cost blunder that anyone ever tried to cover up by claiming a computer program bug was

It must have cost the Soviet vernment at least 100 million dollars (in rubles, of course). Maybe the Soviet public is gull-ible enough to buy that old prong-bug story, but I'm

You told the Western press that your unmanned spacecraft, launched on July 12 for a landing on Phobos, a moon orbiting Mars, was accidently turned off ost 60 days into its missi never to be turned on again.

You further said this failure ned because of the om sion of a single character in the nds of lines of code in the craft's control programs - in Lacht is an IDG News Service correndest based in Tokyo.

Monumental bug isn't such a monus

worthy of more than a passing remark? How did it avoid being onticed by scientists conducting ced by scientists conducting d-based tests? Was there on fity assurance of the soft-re? Was Phobos-I really ught down by the lack of a character?

You explained that some time fer its launch, the space robe's solar panel orientation was incorrectly set because of

the bug.

This action, you told us, prevented Phobos-I from receiving
enough sunlight to maintain its

You then poetically offered, "Phobos-I from to death," a eu-obemistic phrase meaning the I felt as if I were reading a paragraph from The Martian Chronicles when you described the final days before Phobos-I's

COMPUTERWORLD

NOVEMBER 7, 1988

# Newquist FROM PAGE 21

But with the addition of power and in-creased memory to these computers, it became clear that they could handle esal tasks for the individual who was senius usus ou the marvous who was waiting for mainframe time to run some-thing simple — perhaps a spreadsheet. Companies saw that they could foster the use — and thus the growth — of PCs into the mainstream by using them to address

By using a gradual and controlled tactic of deployment, PCs came to be accepted in the very same places they had been

scoffed at less then four years before Today, the PC market is still the larg est growing segment of the entire har

ware business, even though its distinction as a "personal" computer has been blurred by its power as a "workstation" and its newfound abilities to network. Chalk one up for the tortoise over the

Many companies still look to advanced or make big bucks.

technology as a way to save tons of money But in my opinion, 100% of all technologies are overrated and underdeveloped when they first are brought to our atten-

Aren't you glad you haven't switched all your electrical materials over to the promises of superconductivity? Wouldn't

you have looked foolish if you'd thrown all your paper files out when optical storage and scanning became available? How would you be operating your computer system if you'd thrown out your keyboard in favor of a voice recognition device?

system I you o introvolucy your seytours in favor of a voice recognition device?

And trying to get any technology accepted oversight is impossible. Look at the metric system in the U.S. Look at the metric system in the U.S. Look at the standards for optical storage. Look at the sidoption of anything and you see a long hard path of resistance from the established user com-

Haste makes waste
Too often, the brash hare of technology
runs itself into the ground by trying to be
everything to everyone all at once, only to

find that the crowd is rooting for the toe nnt that the crowd is rooting for the tor-toise — a nice, easy-going, nonirritating creature that doesn't upset the way things have always been done — at least not noticeably.

Remember at one time comments.

didn't even have monitors. They didn't have disk drives. They didn't have microprocessors. They didn't have keyboards as we know them today. They didn't have hundreds of thousands of software pack-ages available. They didn't even have ch of anything but a room to then

The technology tortoise has come a long way over the last few decades. But it has always taken prodding from the technology have to get it to keep "racing" for-



# access package...why settle for just a piece of the pie?

If all you went is access to your network, a member of orbinary vandors can hely you.

If all you went is access to your network, a member of orbinary vandors can hely you were prevent. Central Interface given you to power or tests accessed, is in the copy occurrence of the contract of

SOFTWARE SOLUTIONS

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# Blue Magic By James Chposky and Ted Leonsis

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# Competing for Control By Michael Borrus Subtitled "America's Stake in Microelec-

tronics," this book says that the decline of competitiveness by U.S. high-technology organizations against Japanese organ

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# Compared to KnowledgeWare CASE tools the others look like toys

Drawing diagrams on a screen sure beats pencils and plastic templates. And if drawing diagrams is all you want, just about any tool will do.

But most people want a tool to assure high quality system specifications and designs. And hundreds of CASE users have "graduated" to KnowledgeWare's intelligent CASE solution, the Information Engineering Workbench" (IEW). Here's why:

# Dictionary-based tools can't assure consistency

assure Consistently Mont USE tools are dictionary-based. They store graphic components of diagrams flowes, lines, arraws, etc.) in one file., and sore descriptions separately in a dictionary, but have to create diagrams, manually describe what they mean, then manually file shorthe what they mean, then manually file the descriptions to the diagram components. If you forget anything, the diagrams get out of yow with the dictionary, and this leads to inconsistent systems specifications and designs.

# KnowledgeWare's Encyclopedia guarantees consistency

KnowledgeWare tools interpret the actual meaning behind diagrams (object types, relationships, associations, etc.) and store that information in a single knowledge-based "Encydopedia". Request a diagram and our expert system draws it from stored knowledge. So it's impossible for diagrams to be inconsistent with the Encydopedia.

acolodgeWare software products are available from EnowledgeWare soles dices in the U.S. and from Arthur Young International momber firms master the U.S. Ohio Art's Exist-A-Stanck® Magic Screen is available at try

# Keeps all diagrams up to date all the time

The specification and design of computer systems requires iterative changes. And each change can impact many diagrams. With most dictionary-based CASE tools you must repeatedly update every affected diagram, because each is an independent slicking.

It's much easier with KnowledgeWare CASE tools. Each time you enter or modify information through a diagram, the expert system updates the Encyclopedia. And all diagrams automatically reflect current knowledge.

### Enforces the rules of computing

Most CASE tools allow software engineers to specify and design systems that can't be constructed. Their diagrams may have missing inputs, circular relationships, or outputs that so nowhere.

KnowledgeWard's realtime expert system automatically checks and enforces hundreds of logic rules. It calls attention to errors and inconsistencies. And it checks for completeness. All without limiting you to any particular methodology. This automatically assures that specifications and designs can be translated into real systems.

### Automatically redraws information in other formats

A dictionary-based tool that stores diagrams as boxes, text, and arrows can reassemble those parts on the screen. But you only get back the same diagram that you put in. Since KnowledgeWare CASE tools store objects and relationships, you can display that information in various ways. For example, use our Analysis Workstation to draw a Data Flow Diagram. The Analysis Workstation can then automatically construct the corresponding Process Decomposition Diagram.

# Provides a state-of-the-art user interface

Most CASE tools have not kept pace with advances in user interface technology. Some may even require you to learn different interfaces in different parts of their product.

KnowledgeWare workstation tools are mouse-driven with pull-down menus. You can view many diagrams and definitions at the same time in multiple windows – and in different colors. You can zoom in and out, nest diagrams, mask out distracting elemens, and highlight the path of information through a number of diagrams.

For more detailed information on KnowledgeWare's Planning Workstation, Analysis Workstation, and Design Workstation, or any of our mainframe CASE tools, call 1-800-338-4130 toll-free (in Georgia, call 404/231-8575).



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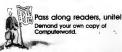


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# SYSTEMS & SOFTWARE

SOFT TALK

Stanley Gibson

# PR/SM's many facets



oning an Enterprise Sysn/3090 mainframe into as my as six processors, each of sich acts as a preferred quest. en-sided multiprocessor 3090s can gain six guests per side. PR/SM can be a boon to users who want to add applica-tions without adding CPUs.

With the recent announce-ment of DB2 Release 2 Version 2, IBM said that PR/SM, previsly capable of partitioning a CPU into four logical units, can

w partition one into six.

It turned out that the capality to partition into six had een an inherent PR/SM canebility all along, but IBM did not nce it at first. Big Blue had to make sure all the bugs

were out, it said. with IBM officials. I asked just what the physical limit of the number of partitions poss ble, but as a practical matter,

# Secure Unix aimed at fed deals

# ANALYSIS

BY MITCH BETTS WASHINGTON, D.C. - Away

washincron, D.C. — Away from the high-profile posturing that currently surrounds AT&T's Unix operating system, Unix quietly gained some valu-able security features during Oc-

At the Federal Con Conference and in separate an-nouncements Oct. 25 and 26, several vendors announced se-cure versions of the Unix operating system to help them capture ligence agencies and aerospace

Vendors that disclosed they have secure Unix products in the government's certification pipene include Harris Corp., Sun licrosystems, Inc., Apollo Com-

The move toward sec Unix systems was inevitab

deral marketing experts said. overnment procurem gan to require Unix at the same time that the U.S. Congress and agencies such as the National Se-curity Agency (NSA) were pro-moting greater accurity for sen-sitive system. note ha

The government will pur-nase \$1.93 billion worth of Unix estems in 1988, and 61% of that spending will be by defer agencies, according to Novon Research Group, a market re-search firm in Berkeley, Calif. In addition, the U.S. Depart-

ment of Defense recently issued Directive 5200.28 requiring that virtually all multiuser computer systems meet at least the C-2 level of computer security

ed by the NSA's Na ing systems and assigns ti ratings. The C level provider to-know protection, audit capability and user accountabil-ity, while the B level adds man-

tory access controls. Lee Musick, progra er for federal systems er for federal systems at Apollo, said one reason for the flood of Continued on page 33

 Distributed processi gives United Airlines iary a lift. Page 27. • Grumman establ support cemer. rage 27.

SAS Institute trundles out
Release 5.18 of system for VAX/VMS. Page 35.

# X/Open scores in Europe

# BY MITCH BETTS

WASHINGTON, D.C. - Gov ernment agencies in the U.S. and Europe are starting to endorse the software portability environment promoted by the X/O<sub>2</sub>

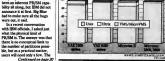
consortium.

At the recent Federal Com-puter Conference, X/Open Co. announced that its vendor-inde-pendent Common Applications Environment (CAE) has been adopted by four European gov-

ent agencies for syst-In addition, the U.S. Department of the Treasury is report-

# **Data View** Still king of the mountain

100 PERCENT OF SYSTEMS



# Beta users on Microvax

BY JAMES DALY

Beta users of the latest mid ange additions to Digital Equip-ment. Corp.'s Microvax line praised the new lods on the block for their processing speed but complained that the new storage element interface on the 3300 and 3400 crimps their ability to employ high-capacity, third-par-ty storage elements.

of several early users surve recently by Computerace Baldeidge said his pair of 34 can often go neck and-neck w his 3600 machines. The rollout also unheres

The rottout also unseren in DEC's low-end storage technol-ogy, the RF30 Integrated Stor-age Element, which is a 544-in unit containing both a controller and a disk drive that is based or DEC's high-end RA series

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Rosemary Hamilton

# Blurred images



en ask yourself s simple on: How soon do I need If an IBM shop has an imme-te need for a system and wish-to tie in that system to an us us in that system to an M mainframe setup, then a & at the vendors with com-rcially available systems to-y would be a solid choice, ing Laboratories, Inc. and oth-currently meet those re-

irements. But if the need for an image stem is not immediate and the er prefers the image system be a built-in component of the

it may be at least another

r. IBM plans to announce a

eral availability date for its

ge system in the first quar-

# Covia rolls out distributed system

BY JEAN S. BOZMAN

DENVER — Covia Corp., the United Airlines subsidiary and keeper of the Apollo airline res-



# Grumman adds mini support for end users

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hors commun. DIGRES mokares the learnance curve with east-to-learn. fill-in-the-form merfaces which allow direct access to entical minmunon INCHES SOE also interfaces with popular programs like John 1-2-3 souses can ming methods facilitate leverage existing knowl edge to become productive right away

The INGRES Main-Server Data Manager is the ords Relational DBMS to provide scalable OLTP performance acros sarele clusered multiamorson or networked ON configurations With its unique Al-based Query Optimizer, INGRES helps one of the world's leading electronics companies

vastly improve overall

system performance

INCRES Consumo gre a pharmacretical reparty direct access to data trapped in an older file system and the abilit to combine that data mon new relational applications INGRES ateways allow access to data across differs

mution systems in the Poted States, Euro and Japan INGRES, STAR provides the most advanced distributed database management file formats (such as and improves access while reducing complex dBASE III and RMS). No ny and costs for hundreds of sunheatons from the shop floor to the board

cial giant links infor-

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# Xerox spawns XIS, eyes scanners

BY JAMES DALY CHISTON MOUNTAIN VIEW, Calif. — Xerox Corp. has set its sights on

\$2,195 price tag. The Kurmed K-56

The Kurzweil K-5000 is a personal computer-based system for high-volume applications that sells for \$15,950. The Kurzweil Discover 7320 Model 5 is geared more for general business environments where noderate. It sells for \$4,995.

Softh are available immediately.

XIS also announced the resase of PC Image software Version 1.5 to support Datacopy's

smily of image processing scanera. Version 1.5 is scheduled to

e available in Image. Herrs.

1 will automatically receive a apprade to the new product upor receipt of their registration

A recent study by Framing hom, Mans.-based market research firm international Dot Corp. states that demand facamers will increase at a conpound annual growth rate of 110% through 1991. Anothe Inc., a Norwell, Mass., research firm, estimates that U.S. sales of deaktop publishing systems incorporating image scanners will top 34 billion by 1990, up from

top 34 billion by 1990, up from 8285 million in 1985. Former president and chief executive officer of Datacopy Rolando C. Esteverens will head up XIS, and the company will retain both the Datacopy and Kura-

Acres (App, Bass et as sights on the energing document stamments the energing document stamments are as a significant of the peripherals companies and arming the newly learned firm with a handful of new products. Acres Imaging Systems, Ioc. (XIS) — which resulted when Datacopy Copy. in Mountain View, Calif., and Cambridge, Mass.-based Karveil Computer Products were boiled down into deet, wholly owned subsidiary and spearhead Xeron's thrust into the field.

into the field.

Both Datacopy, which Xeron purchased in May, and Kurswell, which the firm acquired in 1980, offer a broad range of optical and intelligent character recognition.

scamers. Its first offerings will be a high-performance Datacopy scamer and two Kurrwell scaming systems. Datacopy's 300 dot/n. 730GS flatthed scamer filers six-bit gray-scale information and 64 levels of gray, the company said. The 730GS while a text scanning version sports a

# Grumman

FROM PAGE 27

Siemeens Information Systems, Inc. recently introduced a slower laster printer for users who do not need the high-volume output its current printers' provide. The new 50 page/min printer will be sold directly and through OEMs. It will be svailable in April 1989, Siemens said. Prices start at \$79,500.

Stratus Computer, Inc. recently opened customer support centers in Japan and France. Offering remote and on-line support, the new centers will bring the company's number of worldwide support centers to seven.

Multiflow Computer, Inc., signed a deal with MacNeal Schwendfer Corp. (McS) that will enable it to eventually market the MCS/Natram line of software on its ocientam. MCS will convert the software, which is an engineering suptures. MCS will be for the Multiflow patterns.

Arix Corp., a maker of Unixbased mid-range computers, plans to self the Oracle Corp. relational database management system and Transaction Processing Subsystem (TPS). This is the second agreement between the two firms in one year. Arix said the Oracle TPS will be available in first quarter 1889.

Systems software for MVS data centers Enter the world of total production control, total support. **GOMPUTER** SSOCIATES

# Covia FROM PAGE 27

Unisys Corp. 1100 as and Covin's IBM

e made easier by the near-term elease of TPF 2.4, which sup-orts tightly coupled processors. Jon tow, the system had to be ept at four dyadic processors ecause TPF could only handle ector of product and systems engi

edge, you're dependent on the next release from your vendor." Nonetheless, Covia plans a ent of agic or equ

e cc processors, scat-out the U.S., with

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Gibson FROM PAGE 25

maximum of six offered per CPU engine is more than mo-tuers require, they said. Con-

rith a 3090 E or S model ri ta, MVS weers must be

wity! I associated there is a slightly different PR/SM than the one on the low-end S models and E mot However, VM/XA can make ther version of PR/SM creat to 6 partition. Without VM/XA, the leaser PR/SMs eld only four partitions. Is ere a technological problem ere, some kind of PR/SM bur

Not really, I was told. The decision to offer the amounts PR/SM partitions on some S models but not on others was

w-end 3090 S users wit no. I was

et a lot of PR/SM per

# X/Open FROM PAGE 25

edly planning to specify the CAE in a forthcoming procurement for \$1 billion to \$2 billion worth

of Unix minicomputers.
The X/Open CAE, which is an ntegrated set of de facto, international computer standards, was endorsed by administrative encies in Sweden and West trimany, the UK's Central imputer and Telecommunications Agency (CCTA) and the

nmission of the European Communities (CEC).

Lisa Waxman, X/Open's di-rector of market development, said the benefit for government agencies is that by specifying CAE they will ensure that their applications software will run on my CAE-compliant hardware.

any CAB-complaint hardware.

The U.S. government's National Institute of Standards and Technology is working closely with X/Open, and its forthcoming Applications Portability Profile is likely to have a "90% over-

titions, but IBM was offering nm anyway. So why not offer the same PR/SM option for MVS users?

Good question.
Also, if it is true that only high-end users need more PR/SM partitions, then why can a 200S user under MVS get six partitions per side, but an MVS user of a 600E, which is more powerful than the 200S, only get four per side? Unless, of course, IBM is at-

tempting to steer customers to the new, more powerful S mod els by making sure they have a

es by maning sure they have a richer inventory of features than the E models.

Also, if you could partition as MVS-based mainframe to in-crease its capacity in handling applications, there might be less need to buy a whole new sys-tem. And this is the fourth quar-ter of the uniter a time in which ter of the year, a time in which IBM traditionally wants to sell as

BM traditionally wants to sell as many computers as possible. This is just a guess, and probably the fruit of a devicus mind, but could it have cost IBM more time and trouble to prevent a fall six partitions from being available to E model and low-end S model users un-der MVS than it would to have allowed them those partitions? allowed them those partitions? When pressed, one official said IBM wants to be flexible on

the whole question. "If a 3090 600S buyer said be would buy machine if he could get eight partitions per side, we would try to give him that."

If you're a user and more partitions could help you solve your applications backlog. PR/SM may bear further investion. The bottom line may be this: Ask and you shall receive.

encies were first to reco

the benefits of open systems and CAE, X/Open officials said. In West Germany, the Ger-man Postal Service has already awarded a systems contract specifying the X/Open CAE, and the UK's CCTA has announced Open officials. The CCTA predicted its in-

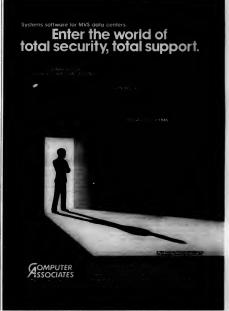
a the Unix operating system.

The CEC, the administrative specifying the X/Open CAE, and the UK's CCTA has announced the UK's CCTA has announced the European Parliament, has introduced or procurements that must comply with CAE, according to in its architecture for a par-Burner.

ropean computer network, offi-cials said. "This Common Applications

dependent software vendors with good ideas will at last find an open market," said W. De Back-

ge systems strategy, ac to Lt. Col. Jerry Johnson



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# Unix

FROM PAGE 25 dor announcements is that as ix becomes increasingly stan-dized, vendors look for ways to gain competitive advantage. "Security is one of those differ-

tors," be said. Apollo, paseu in Communication, has a secure Unix operating system under evaluation by the National Computer Security Center and expects a C-2 rating.

Sun Federal, a subsidiary sed in Mountain View, Calif., began the latest round of an-nouncements on Oct. 17 when it introduced SunOS Multi-Level Secure, a Unix operating system with multilevel security for the Sun-3 and Sun-4 workstations. The operating system, currently under evaluation by the National Computer Security Center for a

B-1 rating, will be available in June 1989 and is priced at \$3,000 per workstation. Last week, Sun Federal added a Tempest version of the Sun-3 workstations, with prices start-

**ECURITY** is one of those dif-ferentiators." LEE MUSICK

APOLLO

ing at \$22,900. Tempest sys-tems are shielded to prevent electronic emissions.

"We're trying to solidify our position in the intelligence field," explained Larry Hambly, president of Sun Federal, which ies workstations to ag

cies such as the NSA. Harris' Computer Sys on, based in Ft. Laud Divison, based in Ft. Lauderdale, Fla., introduced CX/SX, a secure Unix that is said to offer B-1 level security on Harris' supermicros and superminis. The offering, developed jointly with AT&T

developed jointly with AT&T Federal Systems, is under evalu-ation by the National Computer Security Center. William J. Marlow, director of aerospace and defense at Harris, claimed that the socurity fea-tures in CX/SX cause performance degradation of only 5w, compared with 20% to 40% for

competing secure systems.

CX/SX, available in June 1989, will cost roughly \$25,000 to \$100,000, depending on the number of processors and other factors, Marlow said.

Gould, Inc., based in Ft. Lau-

derdale, has the only secure Unix, UTX/32S, that has been fully certified at the C-2 level, and the company is planning to announce a B-level product be-fore the end of the year, a

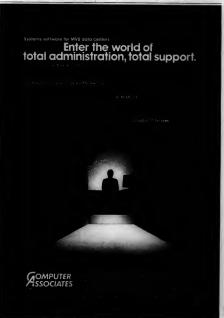
market for secure Unix to take market for secure Unix to take off in 1990. By then, be said, agencies will feel comfortable that there are multiple vendors with mature technology, and they will be facing the 1992 man-date for C 2 materials.

The move toward secu Unix systems was highlighted several other developments:

said the next version of its SCO Unix System V/386 will have C-2 level security. Release 3.2, available in first-quarter 1989, will be accepted with Co.

office automation syste have C-2 level features. • X/Open Co., an inter

rp. and Siemens AG locat ishoro, Ore., recently meed a secure operating



# **Beta users**

CONTINUED FROM PAGE 25

face is different from the Microvax II trface in that it limits their ability to ploy high-capacity, third-party storage

products.
"We could put in a Dising controller and a Mastor disk drive on a Microwat III and have 6000 Mystes on a disk, bytes on a disk, but the DSSI we don't have that option," said Max Egenholer, a research assistant at the University of Maine, who has used a 500 for free meant of the third of the most of the Company of the Microwat of the Micro

pany's continuing plan to incorporate er end functionality into smaller and

ess expensive systems.

Other users said they were concerned about the limitations of the 300M bytes of storage the 3400 offers. "The 3600 is able in terms of disk

# Hamilton

CONTINUED FROM PAGE 27

dent about its image systems strategy. When asked what the IBM approach is, Dave Liddell, manager of marketing plans for image application systems at IBM, said, "We didn't build an image product. We built image into our product line."

ie."

IBM says that while other vendors
in only offer hooks into the IBM world,
by IBM will be offering a system that
see its DB2 and is built with the basic
idding blocks of IBM's Systems Applicides Architecture. The image system's
orage devices will eventually be manorage devices will eventually be maned by the system-managed atorage
imponent of the IBM MVS/ESA oper-

of million of the component of the IBM MVS/ESA oper-ating system.

For those large data processing shops with aiready-strong IBM commitments, that is a big plus. Among other things, an Bullet cooler would give them a student old data, to the management of impond the control of the control

says it has made 120 sales.

IBM says it has talked about its image system plans ahead of releasing a product cause it wants to help users plan for

This point/counterpoint routine isn't worth much at all to users. But this competition has given them a choice. The user needs only to look to his own require ments and ignore the vendors' verbal sparring.

nitton in Computerworld's sensor editor, sys-

space and memory," Baldridge said, "and it would be very difficult for us to do what we need to do with a raft of 3400s, simply because they lack the disk space."

In recent weeks, DEC has guarded against the possibility that the processing speed of the 3300 and 3400 — which DEC claims offer 2½ to three times the

performance of a Microvax II - will present a more attractive price/performance sens a more attractive proceperformance atternative to users than the 3500 and 3600 by souping up the higher models. The Maynard, Mass., company has an-nounced that it will double the address-able memory on the 3500 to 64M bytes early next year and increase the ma-

ine's Q-bus expansion slots from 12 to Additionally, DEC has announced an

THE 3600 IS still a lot more expandable in terms of disk space and memory, and it would be very difficult for us to do what we need to do with a raft of 3400s, simply because they lack the disk space."

NEIL BALDRIDGE COMPU-SHARE

expansion enclosure for the 3500 that al-lows for the addition of two more RA70 disk drives, "Obviously, we want to keep the upper end of the line as robust as pos-sible," a DEC spokesman said. Still, the price differential between the nearly \$100,000 for a 3600.

models remains extreme: The 3400 sells for \$53,950, while a user must fork over

Egenholer also said he thinks that DEC's choice of the TK70 296M-byte new machines was a mistake.

"It's unreliable and slow

# One solution to three



The new IBM PS/2 Model 30 286.

IBM Fersons System 2: PS2 and PC AF are registered indemarks, PC KC Operating System 2,05/2 and Displayurite are trademarks of IBM Corporation Littur and 1-2-3 are registered indemarks of Laus, Development Corporation Microsoft is a registered indemark of Microsoft Corporation, (Base our registered in

#### NEW PRODUCTS - SOFTWARE

System software an Microsystems, Inc. has intro-ced SunOS Multi-Level Secure

(MLS), a Unix operating system designed to provide secure computing in an open-SunOS MLS runs on Sun-3 and Sun-4

platforms. The operating system is an ex-tension of SunOS, which is a convergence of AT&T's Unix System V and the University of California at Berkeley's Unix.

e vendor said. SunOS MLS costs \$3,500 per work-

Sun, 2550 Garcia Ave., Mountain View, Calif. 94043. 415-960-1300.

Sas Institute, Inc. has revised its Sas System Under VMS for Digital Equip-ment Corp.'s VAX platforms. Release 5.18 will reduce CPU de-mand through significant performance improvements in SAS data set I/O and in

processing raw data files, according to the vendor. The product has also enhanced support for larger production job environ-The Sas System Under VMS Release 5.18 is licensed on an annual batis with re-newals available at lower rates. The first-

Cary, N.C. 27512, 919-467-8000. Development tools

machine classification. Sax Institute, Box 8000, Sas Circle.

year license fee for basic Sas software ranges from \$700 to \$10,000, depending

Progress Software Corp. has intro-duced a front-end productivity tool de-signed for DCS-based The Santa Cruz Op-eration, Inc. ScO Xeniz 286- and 386-based NCR Corp. Towers machines and

based NCR Corp. Towers machines and Sun Microsystems, Inc. machines. Called Fast Track, the meau-driven application builder is used with the ven-dor's fourth-generation language (4GL) relational database management system package. It includes a report writer,

screen painter and menu editor.
Pricing for the Progress Application
Development System, including Fast
Track and the 4GL DBMS, ranges from
\$1,450 to \$154,000.

Progress Software, 5 Oak Park, Bed-ford, Mass. 01730, 617-275-4500.

I-Logiz, Inc. has expanded its line of Statemate real-time systems engineering tools. Designed for Ada environments, the products are available for worksta-tions from Sam Microsystems, Inc. and Apollo Computer, Inc. as well as Digital Equipment Copy. Microsystems. The Statemate Prototyper's said to The Computer of the Copy of t

costs \$25,000 per user. The Statemate Documentor is an automatic documen-tation package with the U.S. Department of Defense 2167A templates and costs \$15,000 per user, the vendor said. 1-Logax, 22 Third Ave., Burlington, Mass. 01803.617-272-8090.

### of your biggest needs:

#### Power

Now you can get a lot more work done in a lot less time.

Not only can the new IBM nal System/2° Model 30 286 run your DOS applications, it can run them fast. In fact, it's a system that's up to twice as fast as the popular PS/2° Model 30, thanks to its advanced technology and

286 chip. What's more, as your needs grow, so can your system. Its power can be extended by adding up to 4Mb of memory right on the system

It's a high performance syste without a high price tag.

#### Affordability

The new Model 30 286 cor with many standard features that are optional on other syste class. For example, dazzling VGA graphics, as well as printer, comm ations, and mouse ports are all built into the system, so option slots are free for other uses. You also get a performance-boosting disk cache to help "turbo-charge" some of your applications.

And, of course, you get PS/2 slity and reliability, which helps quality and residualy, with an in-make short work of your long-term

One other small feature com standard, too. The Model 30 286 costs less than you might expect, which makes it an affordable choice

for everyone. And, since this system works with much of the software and hard ware you may already have, you'll be getting the most from your IBM

#### Compatibility

The new Model 30 286 run most of the DOS applications you use today, like Lotus 1-2-3? Displ Write," Microsoft® Works and dBase? It accepts a variety of PC AT<sup>®</sup> expansion cards, and like the other entry level PS/2 models,

many PC and PC XT\*\* cards as well Yet the Model 30 286 fits right in with the rest of the PS/2 family. It can communicate with the most advanced personal systems and can be configured to run IBM's OS/2"

versions 1.1. For complete details about the Model 30 286 or any of the more advanced members of the PS/2 family, contact your IBM Authorized Dealer or IBM Marketing Repre tative. For a dealer near you, call 1-800-IBM-2468, ext. 101. You'll find that the new Model 30 286 is stment that's right for today, ready for tomorrow.

#### Applications packages

Abraxas Software International he amounced that its Athena line of accoun-ing software, written for fourth-general

ing software, written for fourth-gene tion language environments, is now op able on 33 different hardware platform. The Athena Wholesale Distri-tion and Accounting System cons-of six modules, including general ledy accounts payable, accounts receivable. accounts payable, accounts recorrible, in-ventory management and customer order processing and shipping, as well as purchase orders and revenue, All air respect-only operate on AT&T, IBM, Displat Ibm, and the control of the contro

Global Software, Inc. has announced Release 3.0 of its Accounts Receiv-able and Credit Management Sys-tem (ARCMS) for the IBM System/38 According to the company, the software is also fully functional with the IBM Appli-

Continued on page 36



1-819-500-1414

TOTAL OF STREET AND ADDRESS OF

sion and credit-inquiry screen code expansion and credit-injury acrees functions. A dual-period accounting facili-ty has been added that permits users to post cash or perform journal entries for the next accounting period without hav-ing to close account records for the cur-

nt period. ARCMS 3.0 is priced from \$30,000 to ARCMS 3.0 is priced from \$30,000 \$40,000, depending on configuration. Global Software, 1009 Spring For Road, Raleigh, N.C. 27615. 800-36 7890.

Peripheral Software Concepts, Inc., a supplier of automated data collection and shop-floor management systems for

the manufacturing industry, has intro-duced its Striped Lightning product line for use on Hewlett-Packard Co.'s trum series of comp

The software reportedly features a set of real-time data collection modules that de time and attend nce reporting. shop floor labor collection and reporting, pre-payroll processing, security access control and detailed serial number and lot

tracking. A work-in-pro clity is also provided.

Striped Lightning is priced from \$30,000 to \$70,000, depending on con-

figuration.
Peripheral Software, 600 Johnson Ave., Bohemia, N.Y. 11716, 516-563

A mainframe-based documentation soft-ware package that operates in an IBM CICS environment has been

Cit.S envaronments
by Naparsoft, Inc.
Called Napar-Doc, the software is
said to work in conjunction with the company's Napar-Word mainframe word processing package to automatically prepare
and maintain documentation, manuals,

books and reports.

The product will automatically produce a table of contents, a list of appendices and figures and an index, according to Naper-Doc is priced from \$3,000 to \$7,500, depending on hardware configu-

ration. Nap Napersoft, 1 Energy Cente ville, Ill. 60540, 312-420-1515. er. Nas

J&KH Software has released a Unix-based software publishing package. According to the company, PSteat-plus does not require knowledge of type-setting terminology or special terminals,

so it is available to all users on the system Features include automatic correction salignments, spreadsheet compres on, automatic calculation and extensive on, automatic caramaton and excessive erging capabilities. The product is cur-ently available for AT&T, Harris Corp. dd Unisys Corp. Unix engines. It sup-orts a variety of spooled Adobe Systems,

ports a variety of spooled Audooc Systems, Inc. Postercipt printers. PStext-plus is priced from \$1,495 to \$4,995, depending on configuration. J&KH Software, 4911 S. 31st St., Ar-lington, Va. 22206. 301-294-0515.

A menu-driven management system de-signed for maintenance departments with signed for maintenance ceparumene was little or no computer expertise has been announced by J B Systems, Inc. The software, called Main-

annosaced by J B Systems, Inc.
The software, called Mainsaver / 400, was designed to run on
BMF a Application System/400 series of
mincomputers. Six modules are included
work Order, Bulget, Maintenance History, Inventory, Purchase Order and Preventire Maintenance. The product also
provides a relational distribute and a
monthly report, peneration facility.
Maintenance/400 is priced from
181,000.

JB Systems, Suite 640, 21600 Oxnard t., Woodland Hills, Calif. 91367. 818-340-9430

A word processing package for Pick Sys-tems, Inc. Pick-based computers has been introduced by Aurotech, Inc. Called Aurotext, the product report-edly runs on Applied Dagital Data Sys-tems, Inc. a ADDS 1700 and 6000 series and Altos Computer Systems' 3068 Pick systems. Most of the system is written in Basic, and the software allows the user to display and edit two documents at the me time, the vendor said. The product is shipped with the sys

tem tape, cartridge or diskette, a key-board template, an installation guide, a program tutorial and a reference manual. Aurotext costs \$395.

Aurotech, Suite 900, 5445 DTC Pkwy., Englewood, Colo. 80111. 303-

MacNeal Schwendler Corp. has expanded its family of software products dened for electromagnetic analysis Three programs are now offered: MSC/Magnetic for two-dimensional analysis on workstations and mainframes;

maying on wonstatuons and maunrames; MSC/Maggie for 2-D analysis on IBM Personal Computers; and MSC/Mag-num for three-dimensional analysis on mainframes and supercomputers. The maintrames and supercomputers. The software runs on several hardware plat-forms, including machines from Apollo Computer, Inc., Convex Computer Corp., Cray Research, Inc., Digital Equipment Corp. and Floating Point Systems, Inc. The programs also run on IBM Personal

Computers.

MSC/Magnetics is available for monthly learning from \$800 to \$1,500 per month. MSC/Magnum is also variable on a monthly lease bears, with prices ranging from \$1,000 to \$2,500.

MSC/Magnet, he PC-based product, can be leased for \$200 per month or purious of \$2,500.

MacNeal Schweedler, 815 Colorado Botel. Los Angueles, Calif. 90041, 213-MacNeal Schwendler, 815 Colorado Blvd., Los Angeles, Calif. 90041. 213-258-9111.

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sinal. This enables maintrames ons to be submitted at remot g the same dial-in line a PC o provides 1286/87 printer emula ocal screen print feature for ASCI s. 3211/1403 system printer ion is also supported by HYDRA.

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CNEC America, Inc. 7/88

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CaC Computers and Communications

#### Utilities

Optima Software, Inc. has announced the availability of Change Man, an automated library change and configuration management system

mated thrary change and configuration management system. The product automates the migration of software changes from testing through the production stage while ensuring the relationship between the source code and

relationship between he source code and executable modules.

The software also handles JCL, COPY, fastbase control files and documentation. The system runs under IBM's TSO/ISPF and provides on-line capabilities for verifcation and approval of changes. Change Man is priced per site, depending on configuration. Pricing for the system starts at \$20,000. Optima, Suite 300, 1010 Hurley Way, Sacramento, Calif. 95825, 916-646-3800.

A dynamic buffer-allocation expert software has been introduced by Goal Systems International, Inc. Called Hyper-Buf, the product offers significant improvement in VSAM batch

significant improvement in VSAM batch processing time, the vendor said. The software is said to automatically allocate buffer space for VSAM files under IBM's VSE, MVS and CICS. It will intercept VSAM OPENs and Oyensnecally allocate I/O buffers based on the accessive storage savailable at the time of OPEN and user-defined rules.

Hyper-Buf supports VSE 1.3.5 and

above and all releases of MVS/SP, MVS/XA and CICS 1.5 and above, according to the vendor. Permanent licenses cost from \$4,500

Permanent licenses cost from \$4,500 to \$11,000, depending on operating system and CPU size.

Goal Systems, 7965 N. High St., Columbus, Ohio 43235. 800-848-4640.

Programment has announced the general availability of its Strobe application tuning product for use in IBM's MVS/ESA environment.

environment.

According to the vendor, the Strobe
Performance quantifies performance giass attributable
to the use of data spaces, hyperspaces, odata windowing and the Virtual and Library Lookaside facilities within or

MVS/ESA. The user can tune applications operating in batch, CICS, IMS/DC or TSO environments, as well as those using VSAM, IMS/DB, DB2 and other database facilities.

Strobe for MVS/ESA is priced from \$29,900. Programart, 1280 Massachusetts Ave., Cambridge, Mass. 02138. 617-661-3020.

A Viewlogic Systems, Inc. has ported its mixed analog and digital simulator to Sun the Microsystems, Inc. Unix-based ma-

Called Viewsim/AD, the product was co-engineered by Viewlogic and Microsim Corp., s Laguna Hills, Calif.-based

The system simulates designs by combining analog and digital functionality as tasks under Sun Unix-based or Digital Equipment Corp. VAX/VMS operating systems.

Equipment Corp. VAX/VMS operating systems. Viewsim/AD runs under a proprietary multiwindowing environment, and both versions are said to support existing digital- and analog-device libraries. Viewsim/AD for the Sum-3 worksta-

Viewsim/AD for the San-3 workstation costs \$25,000. Viewlogic, 313 Boston Post Road W., Mariboro, Mass. 01752, 508-480-0881.

Microsystems Engineering Corp. has introduced the Mass-11 Graphics Processor Version 5.0 for Digital Equipment Corp. VAX computers.

The latest update of this graphics translator gives users the option of either integrating Testronic, I.e., files into a Mass-11 Word Processing document or outputting them directly to a variety of laser printers, according to the company. The Mass-11 Graphics Processor Version 5.0 is priced from 3995 for the Vaxiation to 18.75% for the VAX 8500 se-

station to \$5,750 for the VAX 8500 series, including the 6200 models, the company said.

Microsystems Engineering, Suite 400, 2400 W. Hassell Road, Hoffman Estates.

III. 60195. 312-882-0111. New at Unix Expo '88

New at Unix Expo '88
The following software products were an nounced at Unix Expo '88 in New York:

Statware, Inc. introduced an integrated data analysis package that runs on a variety of Unix-based systems. Called Statit, the graphical and statistical software pockage includes a quality control module that incorporates industry-standard statistical process-control charts, the vendor

The five-module system is priced from \$1,350, depending on hardware configuration.

Statusers Suite 109, 260 S.W. Madi.

Statware, Suite 109, 260 S.W. Madison Ave., Corvallis, Ore. 97333. 503-753-5382.

Verity, Inc. amounced the availability of a full-text retrieval software system devolped specifically for Pyramid Technology Corp.'s Series 9000 family of University of the Series 9000 family of University of the Vendor, Topic was designed specifically for client/server networks, and the product to capable of retrieving any documentable on a network regardless of formable on a network regardless of formation of the production of the product

mnt.
Topic is priced from \$12,500 to \$40,000.
Verity, 1500 Plymouth, Mountain View, Calif. 94043. 415-960-7600.

Finally, the dBASE you've been waiting IV.



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The new dBASE IV<sup>20</sup> features all these enhancements and more. Is automatic, built-in compiler executes programs significantly faster than before. And its new Command Center less you enter date, do queries and generate reports all without having to write programs. You simply interact with menudriven, "What Shui See's Ew Mark-You-Get" screens. Experienced users can continue using familiar "dot prompt" commands. Or, take advantage of dBASE IV's new IBM® SAA-compatible SQL commands. Of course, dBASE IV runs all your dBASE III

PLIS programs. Only better. And most single-user dAS-E III PLIS and dBASE IV applications can now run as multi-user applications. Without modification Only Software Spectrum offers you dBASE IV at a price you can't pass up. As well as the most reliable, responsive service in the business. So what are you waiting forf Call 1-800-624-0503" for more in-

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#### NEW PRODUCTS — SYSTEMS

1212

#### Processors

uston Computer Services, Inc. an-mond a multichannel communications to a multichannel communications snor unit (MCPU) expansion board ned for Texas Instruments, Inc.'s

ss System Computers. product is said to be a full-slot printed cir-cuit board that allows 12 terminals to con-nect to a single slot in the TI business sysm chassis via RJ11 telephone-style

connectors.
The MCPU/212 board costs \$2,195.
Quantity discounts are available.
Houston Computer Services, Suite
200, 11001 S. Wilcrest, Houston, Texas

Heth Graphix Corp. Composition Systems Division has introduced a test and for the composition of the composi

Itek Graphix, 34 Cellu Drive, N N.H. 03063. 603-889-1400.

#### Data storage

patible mainframes has been an-ced by First Alliance Software

nounced by First Alliance Software and Technologies, Inc.. tem and Technologies, Inc.. tem Pass A 4480 subsystem is reported to be fully format: and medie compatible with the IBM 3480 cartridge tags. The unit is disrent on three different drive and controller configurations and offers and controller configurations and offers and controller configurations and offers and offers and the configurations and offers and the configurations and offers and the configurations and the configurations and the configurations and the configuration of the configurat

to \$136,610, depending on configuration

First Alliance Software and Technol-ogies, 11770 Bernsrdo Plaza Court, San Diego, Calif. 92128. 619-487-8030.

A tape subsystem that offers 2.2G bytes of automatic data backup for the AT&T 38, NCR Corp. Tower, and Unitys Corp. U Series of computers it available from Feth Systems and Software, Inc. Called Tinytape, the Sum magnetic carridge is slapped with error correction software and small computer system in-certaing Co. Soft Societies. The two-bay cabinet also contains an internal power supply, SCS pla connection and the company, SCS pla connection and calculated the second software and maintains and internal power supply, SCS pla connection and calculated the second software supply, SCS pla connection and calculated the second software supply, SCS pla connection and calculated the second software supply, SCS pla connection and calculated software supplies to the second software supplies the second software supplies to the se A complete Tinytape system costs \$10,000.

Feith Systems and Software, 1 Bala Plaza, East Lobby, Bala Cynwyd, Pa. 19004. 215-667-5575.

ems Industries, Inc. has introduced a trio of tape drive subsystems de-veloped to support Digital Equipment Corp. HSC50 and HSC70 controllers.

The 9-track SI2200 features 200 in./ sec. capability and offers a 1.25M bit/ sec. data transfer rate. The SI2200 vides 100 in./sec. stres

NOVEMBER 7, 1988

and was designed for disk data backup and data distribution applications. Both in-clude tape transport, formatter/con-troller, power supply and resident diag-

nosuca.

The 8mm SI2046 powerpack tape cartridge system is said to connect directly with the HSC series; it provides backup of 4.6G or 9.2G bytes of information with-

ce 4.00 of 9.2.0 pyles of information win-out operator intervention.

The Si2200 is priced from \$55,000, the Si2100 costs from \$30,000 and the Si20046 ranges from \$28,000 to \$50,000. Systems Industries, 560 Cottonwood Drive, Milpitas, Calif. 95035. 408-432-



Summus Computer Systems mis an nounced an 8mm, belical-scan tape with disk. The subsystem was developed spe-cifically for Digital Equipment Corp. PDP, VAX and Microvax computers, according

to the vendor. The Sum 14205:

to the vendor.

The Sum 1 4205 reportedly provided more than 26 bytes of formatted tape capacity and 760M bytes of disk storage.

The deaktop unit is priced at \$13,985. Summos Computer Systems, P.O. Box 219270, Houston, Texas 77218. 800

#### I/O devices

Decision Data Computer Corp. In announced two matrix line printers deve-oped for use with IBM mid-range computer or systems, including the Application Sys-tem/400 series.

Designated the 6709 and the 6711 both units offer IBM 5225 envalation an



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tic functions. The 6709 reportedly provides a draft mode speed of 1,200 line/min and is priced at \$13,500. The 6711 performs at 1,400 line/min in performs at 1.400 interims in draft mode and costs \$15,500. Seven resident fonts are sup-plied with each printer. Decision Data, 400 Horsham Road, Horsham, Pa. 19044. 215-956-5728.

Toshiba America's Informa-tion Systems Division has in-troduced a 24-pin letter-quality

nter, Expresswriter 311. The dot matrix device offers The dot matrix device others nee resident emulations, 16K tytes of buffer and a mean-time-etween-failure rate of 4,200 ours, the vendor said. Letter-usatry printing is provided at 60 har /sec. and 180 char /sec. in

ed draft mode. The Expresswriter 311 is scheduled for shipment this month and is priced at \$589, the

month and as peace-vendor said.

Toshib America. Informa-tion Systems Division, 9740 Ir-vine Blvd., Irvine, Calif. 92718.

A combination hardware/soft-ware product that acts as a translator and spooler has been announced by Grafixland. The Transplot 1000 was designed to eliminate incompati-



Graffixiand's Transplot 1000 translator/specier

bility between software drivers, hardware controllers and vari-ous peripherals. The system also rovides a means for spooling

small personal computer

and small personal computer systems, the company said. A basic configuration consists of one translator, 10M bytes of spooling and two ports. The price is \$2,500. Graficiand, 8136 Orion Avc., Van Nuys, Calif. 91406. 818-

A general-purpose VDT that of-

A general-purpose VDT that or-fers a touch-screen user inter-face as well as a keyboard has been announced by Applied Digital Data Systems, Inc. The 2020 Touch Terminal reportedly provides a 14-in. non-

glare flat-faced CRT and is available in green, amber or white. The terminal is priced at \$1.595 and is primarily targeted at value-added resellers.

Applied Digital Data Systems, Display Products Division,

#### 100 Marcus Blvd., Hauppan N.Y. 11788, 516-231-5400. ower supplies

A low-cost powerline monitor is now available from Dranetz Technologies, Inc. Designated the Model 646-

Designated the Model 640-1, the 11-pound unit monitors sags, sarges, impulses and fre-quency changes from single-phase and neutral-to-ground in-stallations. It costs \$3,000, with optional built-in modem and un-

interruptible power supply.
Dranetz Technologies, CN91, 1000 New Durham Road,
Edison, N.J. 08818. 201-287-

d Power Co. has introduced an uninterruptible power supply with a direct inter-face to the IBM Application System/400 mid-range computer. The Series 1000 Model UP-400 D is available in 6-, 12- and 18-kVA models and offers 10min. power supply backup.

A complete 6-KVA UP-400 D
package for the IBM B30, includ-

package for the lists is so, incusing a power warning feature and 15 ft of cable, lists at \$9,169.

Controlled Power, 1955 Stephenson Highway, Troy, Mich. 48083, 800-521-4792.

Pioneer Magnetics, Inc. has announced the Model 25-88 AC/DC switching power upply. The unit reportedly provides 1.5% watts of power in a standard 5- by 8- by 15-in. case and is targeted for Lebcommunications and computer-system applications. It features multiple output channels and delivers 5 V and up to 240 amps in the main channel. The 25-86 costs \$1,495 in single-munifilies.

quantities.
Pioneer Magnetics, 1745
Berkeley St., Santa Monica,
Calif. 90404. 800-233-1745.

New at Unix Expa '88

These products were annount at Unix Expo'88 in New York:

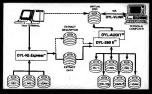
A multiuser Xenix board designed for IBM Personal System/2 computers was unveiled by Comtrol Corp. The Ultra 186/MC was developed to officed the system CPU and free it for other tasks. It lists for

\$1,395.

Comtrol, P.O. Box 64750, St. Paul, Minn. 55164. 800-333-

MAD Intelligent Systems, Inc. demonstrated the Smart Data System, which reportedmajor Unix relational databases oss bed networks.
The Series 5000 Database

Server is an 80386-based 25-MHz machine. The Madaccess SQL integrator provides transparent-access interfaces to sev-eral relational databases. The Series 5000 is priced from \$25,000 to \$200,000. Madacstoron \$8,000 to \$50,000 per copy. MAD, 2950 Zanker Road, San Jose, Calif. 95134. 408-943-



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oes pricol perioritation of any 14 cuties.

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referential integrity in the distalace rather than ine referential integrity in the distalace rather than ine to DBMS enforced integrity is critical for your applica
distributed volvatations accessing athered databa

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m, surface-mount technology, and custom chip designs.

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one is going to want at least an intel 386, a scads of random-access memo-ry to multitask with IBM and Microsoft's OS/2 Pres nager. Based on a quick cal-stion, we could be talking an y \$7,000 to \$10,000 to plun

essy st, 5000 to \$10,000 to pinns all this on someone's desk, nev-er mind training and support. The U.S. economy may be do-ing well so far, but not that well. The problem for MIS will be The problem for MIS will be to decide who deserves this kind of system. Cost-justifying Pre-sentation Manager, when an IBM Personal Computer XT or AT clone is doing just fine, will be darn near impossible. Most folks use a PC for simple tasks and have already learned the

y software packages.
For highly paid or highly chaical employees, cost-justifi-tion has always been simple. The employees' time is worth a lot of money, and any ounce of extra productivity is worth the thousands of dollars it costs to

get it.

But for others, the speed of the PC or the graphics or the Continued on page 62

#### PCs replace pencils at Hughes

Computer classes spark interest throughout aircraft maker's blant

BY JULIE PITTA FULLERTON, Calif. - WI

executive secretaries are asket to trade in their trusty typewrit-ers for Apple Computer, Inc. Macintosh personal computers, some are likely to balk at the change.

But not Joanne Peterson, an executive secretary at Haghes Aircraft Co.'s Ground Systems Group. She simply signed up for an introductory Macintosh class

> **Data View** Steady as she goes

Today, Peterson is comfort-tible with her Maciatosh, and her soss, who also works on a Mac, is dessed with the change. Now, hey can pass disks back and orth and, with a few quick key-trokes, make alterations on strokes, make alterations on each other's work, which might have taken more than twice the time with a typewriter.

"I like working on the Mac; it's fun," Peterson said. "If I run into any trouble, the trainers are right down the hall."

seems an unlikely setting for a miniature university. But hidden in the large Fullerton complex is a computer learning center that wide range of users.

Not all the users are beginners. Tim Gantt, a managemen

systems specialist, uses the learning center's demonstration room to convert 5%-in. disks used on his home PC to 3½-in. disks used on the IBM Personal

#### Look out for **Private Eve**

BY MICHAEL ALEXANDER

ortable electronic devices. Dubbed the Private Eye, th Dubbed the Private Eye, the display weighs less than two ounces and is small enough — measuring at 1.1 by 1.2 by 3.2 in. — to be mounted on a head-set. The display is positioned in Continued on page 61

#### End-user computing to have MIS repercussion

BY MICHAEL ALEXANDER

TORONTO - The rise of end TORONTO — The rise of end-user computing, as well as the spread of increasingly sophisti-cated personal computers, will have dramatic and far-reaching implications for MIS managers, said several speakers at the Managing End-User Computing for Greater Productivity and Profit conference held here last

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The new 1-2-3 will offer an exciting

3-dimensional spreadsheet for better organization and consolidation of data. Plus, improved graphics and powerful database enhancements, including the ability to access external databases, like

See your Lotus Authorized Dealer or

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We've changed that, with the new COMPAQ \$137286. It's the first haptop from the company that set the standard in portable computing, And the first laptop to give you everything you want. Without compromise. Creating a new high-

performance PC this small was no small feat. It took a series of engineering breakthroughs to build a smaller laptop that delivers the performance of a desktop—on battery power.

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The first lapton from the company of power, without throwthat are the handard for postable PC's of power, without throwline accounted a lot of sureight

the new COMPAQ SLT/286 weighs in at just 14 lb., with a space-saving footprint. That means

Acquired Shipps and fall by comit

the COMMAN SUITERS are moved the new battery technology that gives you over three hours carrying a spare is no problem.

Replaces and and recharging

Replacement and recharging are fast and early and the battery is everything the runs on it. Every component is optimized to save battery life.

optimized to save battery life. So you can work longer. The COMPAQ SLITZ86 has VGA graphics with

shades of gray. New backlit screen technology produces text and graphics with higher contrast on a 10" di-

agonal screen. So things are easy to read. Now let's take an inside look. The COMPAQ SLT/286 is powered by a 12-MHz

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the capability to run the world's largest library of solvenze with MS-DOS Plus Microsoft Operating System 2.

built in. You can choose a sind peed 48- or 20 MB fixed list drive to complement the standard 131/2\* 1.44-MB

ette drive. Plus you cally expand the 640K of standar memory to 3.6 megabytes internally.

memory to 8.6 magabytes internally.

Your Open II and our Beryboard is just to be used to make your type. It has fall-state lawys, rapect just like the keys on a desktop PC. The keyboard is removable, so it adjusts to the way you work. You get all 12 function keys and an emission bedded numeric keypad. O' if numbers are your

life, add a separate numeric keypad as an option.
Other creature comforts are also on board.
Like an optional internal 2400-baud modem.
Room for two internal storage devices. Ports for a
printer, external VGA monitor and other periph-

80C287 caprocusals as 5 speed garding cruno

At this point you may be thinking that the COMPAQ SLT/286 dues everything a desktop can de You're right. In fact you can even do more at the office with its optional Desktop Expansion Base.

Unlike competitive expansion units, ours wasn't as afterthought. Its integrated design gives you two industry-standard expansion alots along with duplicate

interfaces for your peripherals. The expansion unit even recharges the battery for you.

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satisfaction. And that's an achievement that stands unchallenged. noull find that we we but these

#### **REVIEWS/NEW PRODUCTS**

#### Wordstar revival includes page preview

pro International Corp.'s classic word processing program, is we-inspiring. Wordstar 4 of-ered added features and im-rovements. Wordstar 5 brings

competitive program that chall enges the current champions.

Features: In addition to maintaining the original interface of control-key commands, Micropro has included an alterive interface of pull-down

The program's most spectacular new feature is a page-pre view system. You can view a full page, two facing pages, multiple pages and, on certain systems, to 144 thumbnail pages. You also get twofold and four-

fold magnification that shows the page almost exactly as it will ap-pear when printed, including pecific fonts and proportion spacing. You can even put a 1-in. grid on the display. Wordstar will optionally re-

mat text as you enter it, but a

margins does not auto-matically reformat exist-ing text. Wordstar displays correct line and page breaks, even with proportionally spaced

include a not very wellstegrated add-in out-ner, PC-Outline from rown Bag Software, a as except for Kermit file transfers and a mail list utility that provides

It also offers the capability of sorting and maintaining up to 32 predefined sort sequences, with up to nine levels of sort per se-quence. Profinder serves as an operating system shell, handling host of tasks related to file

management.

Wordstar 5 supports good block operations, and the calculator can handle trigonometric functions. Editing newspaper columns is reasonably effective, although they are displayed side by side for previewing, not edit-

ter 5 is speedier than its pred ing. Wordstar can handle up to

es from left margin, window number and justification fing. eight newspaper-style columns, but they must be of the same width. All measurements are in now directly supports such file formats as Lotus Development Corp.'s WKS/WK1, Ashton-There is no table of auth

ties function and no graphics commands. No support for alterby the clumsy ALT-plus-code number method.

Performance: Poor to very good. Wordstar 5 has picked up a little speed, and Miopro has removed many of the adrances to formatting and re-

Micropro's Wordstar 5.0 Prior \$496 formatting. The program now supports redefinable tabs, although it lacks right-justified and cen-tered tabs. Hyphenation

and some paragraph re-formatting occur as you type. Most formatting

amands are now au tically embedded

Also new, two win-dows can be opened, and

the number of lines in each window can be set.

The status line sports

new indicators including column number and inch-

The GOTO page has been ex-

Tate Corp.'s Dbase II and III and

The spelling checker uses a dictionary of more than 100,000 words, and a spelling corrector can be installed. The thesaurus is

built into the program. Index en-try marking and table of con-

True Basic, Inc.'s True Bas Version 2.03 departs from the de facto standard that has

evolved from the program's roots. While the original lan-

guage was designed as a tool to

aims at being a powerful applica-tion development tool. It follows

Performance: Poor to very good
 Documentation: Very goo
 Ease of learning: Good
 Ease of use: Very good
 Error handling: Very goo
 Support: Poor to excellen
 Value: Very good

inting notes and a we been added. Installation of fonts, selection

and application is quite transpor-ent, and the program includes a printer utility for editing fonts. onto are menu-selectable.
Wordstar still lacks style seets, but 10 predefined rulers, slied style guides, can be oved. There is also a utility that exists for creating a batch file to

download fonts to a laser printer hics integration does not exist. rdstar 5 offers size only for ASCII translations, al-though it will import Wordstar

files from previous versions and export Wordstar 4 files. The file inclusion capability for Lotus' 1-2-3 files is excellent.

**Beyond Basic: A plunge** 

into development

#### 1-2-3 gets analytic with **Project Calc**

Frontline Systems, Inc.'s add-in, Project Calc Version 1.10, esnces the analytical power of tus Development Corp.'s 1-2-Versions 2 and 2.01. Its que approach to project manamque approach to project man-agement combines the general-aed capabilities of 1-2-3 with project-control func-

Features: Project Calc offers 30 project management functions within the familiar 1-2-3 environment. It attaches to 1-2-3 through Lotus' Add-In Manager, giving you instant access when 1-2-3 is running. It can also coexist with standard random-

access memory-resident pro-grams. A version for Lotus' Symphony is also available. Results generated by Project Calc are placed in a standard 1-2-3

ect Calc is its ability to include results in other models, such as adding individual task costs into

a departmental budget.

Project Calc is composed of two modules. One contains the actual project management func-tions; the other is a menu system mulas using the added comput-ing power. You can load the functions module alone and create projects manually. Maximum project size is just over 2,000 ac-

Projects start as tables with task identifier, name, duration and relationship column head-ings. Project cells contain text, numbers or formulas. Resource costs, called assign

Since you cannot enter a job classification or a name in this column, resource leveling is not Project Calc

requires everyone to work according to one control the num ber of work hours per day and indi-cate holidays and other time off.

Frontline Systems'
Project Calc Price:\$156 • Performance: Good

Performance: Good
 Documentation: Very go
 Ease of learning: Very go
 Ease of use: Good
 Error handling: Good
 Support: Very good
 Value: Very good

nish times, overlaps and lags tween tasks.

Formulas occupy all but task identification and description columns of the basic input area. ics options display the ale as Gantt or Program

Features: The maker of this that programs written in True Basic on an IBM Personal Computer will also run on an Apple Computer, Inc. Macintosh, On the whole, we found this to be

executed in one of two ways: You may run a program, which comcode" and then interprets that, or you may compile your pro-gram into permanent B code, which is saved as a smaller file that executes more quickly. You

True Basic supports structured programming with new Select Case, nested if-then-else and DOLOOPS statements. tions are executed by calling their names. If you want to use GOTO or GOSUB statements. you must add line numbers to each line in your program; True

True Basic handles graphics Continued on page 56

#### True Basic Version 2,03

Price: \$99.95

Performance: Good
 Documentation: Satisfac
 Ease of learning: Goo
 Ease of use: Good
 Error handling: Satisfact
 Support: Satisfactory

COMPUTERWORLD



McDonald's faced a challenge. They were spending too much time and resources maintaining 21 different communications networks, rather than on what they do best: selling hamburgers. And McDonald's is growing at the rate of

one new restaurant every 17 hours As Bonnie Kos, McDonald's VP for facilities and systems, put it, "We had to adapt a single approach to all our communications that not only got rid of all our network spaghetti, but allowed us easy connectivity and communications between computers

that use different protocols." The approach they chose was ISDN. Ameritech's Illinois Bell, in conjunction with AT&T Network Systems, and using a 5ESS\* switch, used ISDN to allow McDonald's to migrate to a single, inte-

grated, all-digital network. So now, McDonald's sends integrated voice and data over an ordinary telephone line. Turning every work station into an information center, while minimizing costs

"ISDN will allow us to

spaghetti and concentrate on selling hamburgers."

get rid of our network

and gaining greater network control. But, the advantages of ISDN go beyond simplifying and connecting McDonald's communications network

ISDN will soon allow the company to access more current market data, quickly track product promotions, streamline inventory control and reduce administration workloads. All this means more time to spend one-on-one with the most important part of McDonald's business-the customer

Even now, McDonald's is using such advanced ISDN features as calling number identification, electronic directory and high-speed, high-quality facsimile transmi sion without dedicated lines.

As Bonnie Kos summed it up, "ISDN is letting us do a lot more with a lot less."

#### The Future's on the Line

At AT&T, we believe that's where the future lies for every company-doing more with less. ISDN helps accomplish that today and helps pave the path to a larger vision: Universal Information Services—a world of services available on demand.



The right choice.

#### Wordstar

CONTINUED FROM PAGE 49

Documentation: Very good. Word-r documentation covers the program d all of its add-ons, as well as printer in-

on of the do dises explores customizing, good. On-line help is reason-

ative.

see of learning: Good. Wordstar 5
ires a total of about 40 minutes to get
and running, depending on font- and
ar-installation needs. To learn the
functions through the tutorial takes

as many as two hours for a reasonably computer-literate user. Experienced users who are familiar with older Wordstan sions will have no trouble learning the

nevam at all. Ease of use: Very good. Wordstar ers a host of customization options for changing the characteristics of the pro-

ronnent.

Metsus and belp systems can be tailored to the amount of help needed, and the choice of mens and control-key interaces in a big advantage.

Error handling: Very good. Wordstru uses a backup system that always preserves the most recently saved file as well as the file before it. A timed backup option is also available. The Undo com-

mand is one-level.

Support policies: Excellent.

Technical support: Poor. Micropro
offers a 90-day refund guzramec. Standard technical support is good for the life
of the release plus aix months. Toll-free
support is available Monday through Friday from 7 a.m. to 4 p.m. Pacific Standay
Times and Statricty through Sunday from

Time and Saturday through Sunday from Sa.m. to 1 p.m.
We called technical support nine times in four days before connecting with a technician on a Sunday morning. When we were able to get through, we found technical support to be helpful and accom-

modating.

Value: Very good. For a price of \$495, Wordstar 5 offers a strong complement of features, an exceptionally good

ORDSTAR 5 offers support only for ASCII translations, although it will import Wordstar files from previous versions and export Wordstar 4 files. The file inclusion capability for Lotus' 1-2-3 files is excellent.

print preview function, strong support for mail merge and telecommunications, ar outliner and a host of other useful capabili-



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#### Project Calc CONTINUED FROM PAGE 49 etion and Review Technique, or

PERT, charts. On-screen color graphics are not available. Shading sets apart task bars on the Gantt chart. Tabular reports can be generated All 1-2-3 com erated

can be generated.
All 1-2-3 commands can be used to nort reports, combine and print tables, compare reports in split windows and compare dispits attributes.
Performance: Good. Initially, you'll appreciate the simple, 1-2-3-style means interface, but experienced 1-2-3 users with the property of the pro

ion. You begin a project by checking the work calepdar and entering a starting dark. Yongkent a take and determine its affective to the common of the common cale of the cale o

scheduling constraint, one padding con-straint and one precedence relationship with another task. Costs are accrued ei-ther at the start of the task, at the end or ly throughout the task or project. Project Calc assigns costs both as

Also, Project Cate assigns come oom es fixed amounts or by unit.

The project achedule is updated when-ever 1-2-3 recalculates the worksheet. A delay of a few seconds to several minutes occurs whenever a change or new task is recorded. To world this, set recalculation to manual. Charts are generated almost

instantly, Scrolling is slow.

Documentation: Very good. Project Calc's documentation is logical and nctions and error message descriptions, of it includes a glossary and index. On

ions previously set with 1-2-3's main in-

tions previously set with 1-2-3 a main in-stall program remain intact.

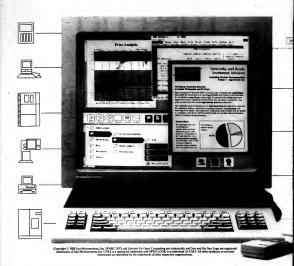
Project Calc assumes that its users have a working knowledge of 1-2-3. Even those with minimal project management experience can design a simple project in

is than one hour.

Ease of use: Good, Although the ating gra

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Systems for Open Computing,"

#### Basic

CONTINUED FROM PAGE 49

in an innovative way. Instead of address-ing pixels, you use the SET WINDOW command to establish your own coordi-nate system on your screen. Points, lines-and areas are plotted in relation to this system. A minor problem is that different acreens have different aspect ratios, so graphics may appear distorted when you

port a program.
On the IBM PC, True Basic is presented in two windows: editing and history You enter and edit source code in the edit ing window, and you enter commands like RUN and SAVE in the history window, which contains the Basic "OK" prompt. On the Macintosh, the two windows — called Source and Command — can be moved and resized, but only the Com-mand window can be closed. The menu bar on the Macintosh version duplicates many of the functions you can perform from the Command window.

The editor has no Search-and-Replace or Undo capabilities, but it will take care of block moves, copies and deletions. It does not do syntax checking.

Libraries of hyperbolic, trigonometric and mathematical functions, graphics and menu subroutines are included. Libraries available at a price of \$69.95 each include a developer's tool kit, PC Basic conversion Fortran conversion communications support and various graphics ex-

Performance: Good. The speed of the True Basic compiler is not impressive. the True Basic compiler is not impressive. The intermediate-compile and runtimes are slow. Also frustrating is the fact that the compiler will catch only five errors at a time. Although the structured environ-ment of True Basic offers such advan-tages as more readable code and easier

maintenance of programs, the conversion process is very difficult. True Basic will perform better with programs developed om erretch

Documentation: Satisfactory. True Basic's documentation includes a reference manual, a machine-specific us-er's guide and a Version 2.0 supplement that covers new features. Finding the information you need is frustrating. The help files provide some assistance, but they are not context-sensitive.

Ease of learning: Good. True Basic's structured layout is logical and easy to teach. On the negative side is the documentation and insufficient conversion utility. An old Basic hack may find it diffi

utility. An old Basic back may had it diffi-cult to learn its different implementation of many commands and statements. Ease of use: Good. Having just two windows for editing and history and being able to scroll back to review what you have done is helpful. However, the simple interface also indicates a lack of power. Trace, Cross-Reference and Format are

Trace, Cross-Reterence and rormst are separate programs that must be run from the command prompt. More integration of the programming environment and a smart editor would make a big difference. Error handling: Satisfactory. The program editor does no syntax checking by itself, although you can try most commands in the history window before add-ing them to your program. We do not know why it stope after it flags five errors. The error messages are informative but do not refer to specific sections of the manuals. Nonetheless, when an error is found, you are returned to the editor at the offending statement.

Support: Satisfactory to very good. Technical support is available by telephone during East Coast business hours. True Basic does not have a toll-free number or corporate support, but the support people are knowledgeable and heloful

belgrid. Value: Satisfactory. True Basic costs \$99.95. Once you start looding it with options — the development tools, the PC Basic conversion program, communications support and advanced string library — total outly in about \$350. This is a lot of money considering the lack of syntax checking in the editor, the lack of a syntax checking in the entror, the sick or a completely integrated programming on-vironment and the confusion of laving multiple reference manuals. We also feel that True Basic is implemented better on the Macintosh than on the PC.

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virtually "design your own service contract." Flus printer supplier and accessories stocked for your convenience. The one and only place for all your office automation needs.

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#### Project Calc

CONTINUED FROM PAGE 52 less convenient than with stand-alone project management packages, the famil-iar 1-2-3 environment makes it easy to do alysis, incorporate results directly into dget worksheets and generate reports. Error handling: Good. Project Calc intifies scheduling logic errors, but it

ng logic errors, but it provides only a very general response. It also spots irregularities between time units used in cost assignment and task du-ration. New data overwrites old data in each cell you edit. Piles are saved and protected from being overwritten in the same manner. Error messages are self-

Support: Very good. Frontline of-fers non-toll-free telephone support at no charge for 90 days. A premium phone ser-vice for corporate specialists who support end users is available.

Our telephone calls were answered promptly and courteously. When neces-sary, we received return telephone calls

sy, we received thin 15 minutes.

Value: Very good. If you've already treated in 1-2-3 and find your projects to manage manually, Project too unwied to manage manually, Project Calc is a good choice. The \$150 invest-ment is a bergain compared with the cost of a dedicated project management pack-

of PretScript are trademarks of Adobe 5 et PLUS is a trademark of Hewlett Packs to a trademark of America

#### Systems

A handheld optical character recognition system and scanner has been introduced by Marq

has been introduced by Marq Technologies.

The menu-driven Marqueys-tem consists of three modular components: The four-button Marquouse, the Marqueather, according to the vendor, the mouse pro-vides a 600 dot/in, recolution, while the scanner offers 16 lev-els of gray-scale at 300 dot/in.

A transparent window is non-

em of gray-scale at 300 dot/m.

A transparent window is pro-vided that allows users to view the image as it is scanned, while the actual numeric data can be heard through an sudio feedback feature. The Marqaystem works with 1BM Personal Computers and and computibles and requires a minimum of 256K bytes of ran-

access memory. largsystem components range in price from \$199 to \$1,299.

Marq Technologies, 6285 Nancy Ridge Drive, San Diego, Calif. 92121. 800-336-8366.

#### Software applications packages An anti-viral product that was designed to complement exist-ing memory-resident virus-

ecking programs has been in-oduced by Interpath Corp. Called Tracer, the package ecutes in two phases: The intial install phase automatically

logs the system's hardware and logs the system's hardware and software parameters, and the check phase executes each time the system is booted. All system parameters are then checked for traces of infection, according to the 'vendor. The software is available for IBM Personal Computers, PC ATs and compatible

Tracer costs \$49.95. Interpath, 4423 Cheeney St., anta Clara, Calif. 95054. 408-

A personal computer product that was designed to provide free 15-min delayed stock market quotes has been ar by Cablesoft, Inc.

According to the company, Livewire is a small computer board with software that runs on any IBM Personal Computer, PC XT. AT or compatible. The product converts stock quota-tions that are carried by televi-nion's Financial News Network to data that can be read on the

Among Livewire's features are alarms, graphics and the abil-ity to manage multiple portfo-

Livewire costs \$995. Cablesoft, 307 W. Burlington Ave., Fairfield, Iowa 52556. 515-472-8393.

#### NEW PRODUCTS software package that en

A software package that engree images on Appic Computer, Inc.'s Macistonia systems has been developed IV Berkeley Systems Design, Inc.

Systems Design, Inc.

Closeview is a control panel device that reportedly magnifies anything on the screen from two IV of times its original size. The screen is the state of the state of the state of the screen from two Berkeley Systems Design, IV Design Systems Design Systems Design, IV Design Systems Design, IV Design Systems D

Three software calculations for BM Personal Comprises and comparable primary controlled to the functionality controlled to the functional function of function and function of function and function additional controlled functions.

The Xact series calc

Venture

tar Saftware's entrepreneur's system

gram designed for emergg businesses and entrepre-curs has been unveiled by Star oftware Systems, Inc.

Called Venture — The En-trepreneur's Handbook, the product runs on IBM Personal sputers and compatible ma-es and reportedly assists users with business planning and analysis functions. Word pro-cessing, spreadsheet, file man-agement and double-entry led-ger facilities are included.

Venture costa \$349. Star. 363 Van Ness Way. Torrance, Calif. 90501. 213-533-1190.

#### Software utilities

Bear Rock Software Co. has enhanced its Printbar II Bar Code Printing software package. Printbar II is a memory-resident utility that allows the user to print bar codes and text directly from most applications

recity from most applications running on IBM Personal Computers and compatibles. Version 2.0 offers support of EAN+3 and EAN+13 Garupessa Article Numbering) Code, in addition to Code 30, intractivened but the code and the code and the code and the option allows do-matrix printers to produce drafter but codes. Printiber II 2.0 costs 3298. Bear Kock, 6009 Exterprise Drive, Pincerville, Calif. 95667, 916-622-4460.

Calctech, Suite 202, 1362 Believue-Redmond Road, Bellevue, Wash. 98005. 206-643 1682.

Two products for Lotus Devel-Two products for Lotus Devel-opment Corp. spreadsheet users are now available from Front-line Systems, Inc.
Project Cale is project man-agement add-in software for us-ers of Lotus Symphony, and 3-2-1 Blastoff 2.0 is s

2-1 Blastoff 2.0 is a spreadsheet compiler that re-portedly allows Lotus 1-2-3 worksheets to recalculate up to ve times faster than previously

possible.
According to the company, 3-2-1 Blastoff does not require an Intel Corp. math coprocessor chip and is available in a standard edition for \$99.95. Project Cacarries a suggested retail price of \$149.95. Frontline, P.O Box 7408, Sun Francisco, Calif. 94120. 800-451-0303.

Macintosh products

Absoft Corp. has developed a Fortran compiler that can be ported to A/UX running on an Apple Computer, Inc. Macin-tosh. Called Macfortran/ AUX, the product is based on reduced instruction-set or ing architecture technology and reportedly meets full ANSI For-tran 77, IEEE P754 and Military COMPUTERWORLD

Standard 1753 specifications.
The compiler supports most Digital Equipment Corp. VAX/VMS and several Fortran-extensions and provides full access to Unitx and the Macintonh Toolbox, the vendor said. A standard standard command line indard Unix-style command line is terface and a Macintosh-style in -style in

terface and a macamous-style in-terface are also provided. Macfortrae/AUX costs \$495. Absoft, 2781 Bond St., Au-burn Hills, Mich. 48057. 313-853-0050.

An enhanced database language for Apple Computer, Inc. Macin-tosh programmers has been an-nounced by DBfast, Inc. The

counced by DBfsast, Inc. The programs offers standard Ashtron-Tate Corp. Dbase III. Plus convention combined with Macintoh graphical interface functions, the weedor mixt. Called DBmsacfast, the software employs an interactive editor/decompiler for writing, compiling, testing and programming debugging and in scheduled for high compiling, testing and programming debugging and in scheduled for high compiling, testing and programming debugging and in scheduled for high compiling and programming the programming the programming and programming the programmin

A mutuuser computer-suded software engineering tool for Apple Computer, Inc. Macintosh computers has been announced Iconix Software Engi

Preeflow V3.0 has been en-hanced to include unlimited defi-nition length and can now define data structures for primitive eleproduct is compatible with Digi-tal Equipment Corp. Tops and VAX-based software capable of emulating Macintosh local-area

Freeflow V3.0 costs \$995. Iconix, Suite 320, 2800 28th St., Santa Monica, Calif. 94045. 213-458-0092.

Software for Recognition Technologies has updated its graphics program designed for Apple Computer, Inc. Macintosh 512E

Apple Computer, see.
512E users.
Ministraw 2.0 now includes
on-line Help functions and frehand drawing capabilities, the
vendor said. The program costs
\$44.95. plus shipping and han-

dling.
Software for Recognition
Technologies, Rochester, N.Y.
716-359-3024.

Innovative Data Design, Inc. is now shipping Dreams, computer-aided design software

omputer-aided design activare leveloped for Apple Computer, nc.'s Maciatosh.

The product includes symbol ibraries, real-world scaling, geo-netric tools and enhanced object nampulation and editing func-

manipulation and editing lunc-tions. The program requires 1M byte of memory and s hard disk, with 2M bytes recommended for the Mac II. Dreams costs \$500.

Dreams costs \$500. Innovative Data Design, Suite A, 2280 Bates Ave., Con-cord, Calif. 94520. 415-680-

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#### Development tools

nt for Intel Corp. nd Microsoft Corp. sachines has been an-The MS-DOS version of Smalltalk-80 costs \$995. Parcplace, 2400 Geng Road, Palo Alto, Calif. 94303. 415-859-1000.

computer programmers, Small-talk-80 reportedly features a

set of development and informa-tion access tools, an object-ori-ented programming language and code modules. Versions are also available for Unix- and Ap-ple Computer, Inc. Macintoshned operating systems. The MS-DOS version

A neural network simulation system for the IBM Personal Computer and compatibles has been announced by California Scientific Software. Called Brainmaker, the product reportedly includes IJO facilities for both visual and sym-bolic data and allows user net-works to manipulate pictures, images, symbols or numbers di-erectly. Support for fuzzy logic is

Brainmaker requires DOS 3.0 or higher and is priced at ires DOS

3.0 or higher and is priced at \$99.95. California Scientific Soft-ware, 160 E. Montecito E, Sier-ra Madre, Calif. 91024. 818-355-1094.

An application development sys-tem that automatically creates its own user's guide has been an-

nounced by International Consulting Enterprises Ltd. Called Applaud, the pro-gram runs on IBM Personal nouters and compatible sys-

Computers and compatible sys-tems and was designed for use by software developers, auditors and for system prototyping. The software requires 585K bytes of available random-access memory as well as DOS 3.0 or

Appland costs \$795 per sin-gle copy; the networked version is priced at \$1,295. International Consulting, 10 S. Riverside Plaza, Chicago, III, 60606.312-454-3200.

Rational Systems, Inc. has announced DOS/16M 3.0, a large memory-development en-vironment for use on Intel Corp. 80286- and 80386-based sys-

tems.

The product reportedly al-lows C, Fortran, Pascal and as-sembly language programs to break the 640K-byte DOS barribreak the 640K-byte DOS barrier and enables programmers to directly address up to 160M bytes of code. The program supports several popular compilers, including Microsott Copy Alticrosoft. C., Microsoft Fortran and Lattice, Inc. 1attice C. An initial development 3-consecousts 85,000.

Rational Systems, P.O. Box 280, Natick, Mass. 01760. 617-653-6006.

Learn-PC Video Systems has developed a training program specifically for users of Wordper-fect Corp.'s Wordperfect Version 5.0.

The program — Wordper-fect: Beginning Through Advanced Skills — is avail-able in all video formats. Each training set includes three video-tapes, three guidebooks and a practice disk, according to the

practice case, exceeding the vendor.

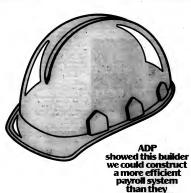
VHS and Beta formats are priced at \$895. Three-and-a-quarter-in. U-Matic tapes are available for \$1,045. Free trial and a see available. programs are also available. Learn-PC, 5101 Highway 55, Minneapolis, Minn. 55422, 800-532-7672.

#### Data storage

A stand-alone compact di read-only memory reader has been unveiled by Scenario,

Called Dynabook, the touch-reen-driven reader reportedly lows the user to retrieve data mply by touching the display in response to on-screen instruc-tions. The product weighs 16 pounds and measures 14 by 14 by 2.9 in., the vendor said, and a personal computer is not re-quired for operation.

Dynabook costs \$4,995. Scenario, 235 Holland St., Somerville, Mass. 02144. 617-625-1818.



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		nürs company	

could in-house.

#### Peripherals

A nonelectronic security device that provides storage protection for code names, passwords and keys is available from Keysure. The plastic security box mea-The plastic security box mea-sures approximately 3 by 6 in., and once shut, it can be opened only by breaking the container. The product is targeted at users who want to have complete ac-

lity from anyone accessing keys or password informa-The Keysure device costs \$3.60, and quantity discounts are available.

Keysure, P.O. Box 439, Prince Station, New York, N.Y. 10012, 212-219-0015.

Radius, Inc. has added another product to its line of display sys-tems for Apple Computer, Inc. acintosh computers. The 19-in. Two Page Dis-

ay System for the Macintosh play system for the Macintonia II displays two 8½- by 11-in, pages or a B-eize drawing for graphical design, page layout or engineering in black-and-white. The vendor maintains that the screen resolution of 1,152 by screen resources of 1,150 by 882 pixels offers users 30% more work space than traditional 19-in. monitors. System soft-ware includes menus that can be detached from the menu bar and placed anywhere on the screen.
The Radius Two Page Dis-play System costs \$1,695 for the display and \$695 for the interKeysure's security device

Radius, 404 E. Piumeria Drive, San Jose, Calif. 95134. 408-434-1010.

A device that allows personal A device users to place a paral-lel printer up to 7,000 ft from the micro system is now available from Practical Peripherals,

Called Microbuffer P/ Link, the unit reportedly has a 32K-byte buffer, which is ex-pandable to 512K bytes, or 170 ages. Ordinary telephone cable pages. Ordinary telephone cable is used for connection and instal-lation, and the product comes with a five-year factory requir and replacement warranty. Microbuffer P/Link costs \$150

Practical Peripherals, 31245 La Baya Drive, Westlake Village, Calif. 91362. 818-706-0333.

Pencept has introduced a digitizer designed specifically for us-ers of Lotus Development Corp.'s Freelance and Freelance Plus software packages.

The Pencept Model 320 al-lows the user to input graphics and character data via a digitisg pad without using the key-oard. The product can reportedly also execute any keyboard

The Pencept Model 320 costs \$1,095. A Model 310 option that plugs directly into the com-puter's serial port is available for \$1,195.

Pencept, a division of Numon-ics, Inc., 39 Green St., Waltham, Mass. 02154. 617-890-8877.

Clary Corp. has announced an option for its Onguard PC-1240 and PC-2400 uninterruptible power supplies (UPS) that wall reportedly allow the units to withstand up to 30 and 60 amps of start-up peak current, respec

tively.

The start-up surge option was designed to eliminate the need to oversize the UPS or use need to oversize the UPS or use a static bypass writch, the ven-dor said. The product provides six times more current than is required under steady-state con-ditions. The option is slated to become standard during the

The start-up surge option costs \$75 for the PC-1240 and \$95 for the PC-2400. Clary, 320 W. Clary Ave., San Gabriel, Calif. 91776. 818-287-

Arkwright, Inc. is now offer-ing overhead transparency film for use with dot matrix printers.

.003-in. polyester and will re-portedly accept both a full spec-trum of color (from color dot ma-trix printers) and black ink. It is available in standard 6%-0 li-lia. and A4 sheet sizes in boxes of 50 paperbacked sheets. The film is also available in sizes for con-tinuous-feed printers. The film costs from \$31 to \$46.55 net will.

\$46.25 per box. Arkwright, Department P, 538 Main St., Fiskville, R.L. 02823.800-942-5900.

#### Board-level levices

An IBM Micro Channel add-in board development system that was designed for the IBM Per-sonal System/2 Model 70 is now available from Capital Equip-

ment Cary.

According to the wedor, One Chip Plans significantly reduces the time and out of designing and building boards for PSZ Computers. The product is a complete Merro Channel interfacturers in 10, memory and maintanction board design. Proc Chap Plans yearnamble decoding for extended memory is included.

One Chap Plans yearnamble according to the Chap Plans of the

Boca Research, Inc. has an-nounced an I/O adapter board for the IBM Personal System/2 The film is optically clear

Micro Channel.

The Boca, MCA parallel of fers one bidirectional parallel port for attaching additional parallel port for attaching additional parallel port for attaching additional parallel p

Two new IBM Personal System/2, Video Graphica Array (VGA)-compatible graphics adapters are now available from Genoa Systems Corp. Super VGA Hires has a resolution of 1,024 by 768 pixels in 16 colors and has 512k bytes of

video memory. The adapter pro vides IBM 8514 monitor capabil

vides IBM 6514 monitor capabi-ity and costs 8645. Genosis island hipping the Shaper VGA shapper, with report-odly officer 664- by 460-pixel and source of the cost of the cost of the cost and cost of the cost of the cost of the same of the cost of the cost of the Shaper Cost of the cost of the Shaper Cost of the cost of the Shaper Cost of the cost of the Adapter hardware, BIOS and Cost one of the cost of the Shaper of the Shaper of the Shaper of the cost of the Shaper of the Shaper of the Shaper of the cost of the Shaper of the cost of the cost of the Shaper of the cost of the cost of the Shaper of the cost of the cost of the Shaper of the cost of the cost of the Shaper of the cost of the cost of the Shaper of the cost of the cost of the Shaper of the cost of the cost of the Shaper of the cost of the cost of the Shaper of the cost of the cost of the Shaper of the cost of the cost of the Shaper of the cost of the cost of the cost of the Shaper of the cost of the cost of the cost of the Shaper of the cost of the cost of the cost of the Shaper



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#### PS/2 hot in West Germany. outsells non-MCA machines

BY DENNIS PHILLIPS

FRANKFURT — Despite slower than expected growth in its sales in the U.S. personal computer market, IBM has reported booming Personal System/2 sales in West Germany this year.

A price tag of about \$10,695 in Germa-

ny has not prevented the Micro Channel Architecture (MCA)-based PS/2 Model 50 from becoming IBM's most popular of-

fering there, said Joerg Balser, spokes-man at IBM's West Germany subsidiary.
"Last year, one-third of our PCs were Micro Channel machines. This year, two-thirds are Micro Channel PCs," be said.

IBM outsold its next three PC rivals — mmodore Business Machines, Inc. Compaq Computer Corp. and Apple Computer, Inc. — combined, in terms of val-ue. During the first half of the year, IBM delivered 31,000 PS/2s with its MCA, and this should reach 80,000 by year's end, according to a recent study by U.S.-based market research firm international Data Corp. (IDC). The surge in IBM sales is an or

on for rivals still reluctant to offer Micro sign for rivale still reluctant to offer Micro Channel-compatible systems, analysts said. "It could be a mistake to wait, as BM is increasing its market share here in West Germany," one observer said. "The competition of IBM is being a lot of time, saying there is no need now for the Micro

saying there is no need now for the Micro Channel. But when you consider these sales statistics, I'd be nervous." By the end of the year, IBM's share of the professional PC market should triple to 21%, according to a recent IDC survey. It will take a lot of imporation and strong sales to catch up, and by then, West Ger-many's PC market may be saturated.

#### Microsoft in fifth leg of Word race

BY DOUGLAS BARNEY

Microsoft Corp.'s Word recently notched its way to Version 5.0, catching up with archrival Wordperfect Corp., which is also now on Version 5.0. In fact, even Micropro International Corp. has a Version 5.0 of its old standby, Wordstar.

The fifth version of the popular Microsoft personal computer word processor reportedly gains OS/2 compatibility, bet-ter integration of graphics, built-in Print Preview, improved data links and net-

HEN WORD first shipped for the PC, it was awkward and lacked features, company officials admit. But with each release, it has gained functions and received a spiffed-up interface.

work support. The \$450 product is sched-uled to ship Dec. 31.

used to ship Dec. 31.
When Word first shipped for the PC, it
was awkward and lacked features such as
integrated graphics, company officials admit. But with each release, the product
has gained functions and received a
spaffed-up interface. Such improvements
led the firm to report over \$1.00 million in

led the firm to report over \$1.00 million in word processing revenue for its latest fis-cal year, according to Jeff Raikes, manyar and Microsoft's Office Bauness Unit.

As the role of older packages, such adaton-Tate Corp. 'a Multimate and Wordstar, has declined, Microsoft's main competitor has been Wordperfect, a firm that does little more than produce word processing software. The two firms have buttled next and suck for features, creating products that some have called over-ing products that some have called over-ing products that some have called over-

In fact, the features war has led to a in fact, the testures war has sed to a whole new class of scaled-down, easy-to-use packages for those with simple word processing needs. In this arena, Software Publishing Corp., with Professional Write, and Symantec Corp., with Q&A Write, hand sone hattle.

User's rool
Word S.O. clearly a power-user's tool,
supports expanded memory and has builtin network support. For work groups and
group odding, the system mantains the
automatic red-things fload in Version 4.0.
but Software, line, Word S.O. beeps
track of each reviewer's comments and
shows when the comment was made,

nows when the comment was made.

Microsoft also borrowed, at least in art, a concept from Borland Internationpart, a concept from Bornara and all, which pioneered the so-called soft-user interface. Where some Borland products an interface that is faliar, Word 5.0 allows a user to find the ord command that corresponds to the nilar IBM Displaywrite command.



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#### Users praise multiuser product for DOS PCs

BY WILLIAM BRANDEL

Early users of a product that brings multiuser features to a PC out requiring an IBM To-Ring network recently praised its speed and multitask-The product called

386/Multiware and is being of-fered by Alloy Computer Prod-ucts, Inc., based in Framingham, Mass. As the product a name im-plies, 386/Multiware brings sev-eral capabilities to DOS users opcrating a personal come based on the Intel Corp. 80386

The product is packaged in various configurations. For ex-ample, when using Alloy's ample, when using Alloy's 386/Multiware operating aya-tem, the NX386 processor, two intelligent IMP2 cards (which two opera) and two each support two users) and two IMP8 cards attached to a terminal array punel, the system sup-ports up to 21 users. This config-uration costs \$5,775.

The product is a boon to PC the protect is a boon to PC shops for two reasons. First, it allows several users to share the same application, creating a 386 PC network without investing in an IBM Token-Ring or Novell, Inc. Netware network. Second the user can perform multitask ing without buying a PC windows product. In short, it gives the user today what an IBM Person-al System/2 Model 70 or 80 running OS/2 might give the uses

'The fact that it offloads RAM access to the IMP cards in-

"The fact tast is outsome.

RAM access to the IMP cards instead of loading up the 386 processor (makes) this product
lightning-fast," said Nick Johnson, president of Compusystens, Inc., a medical computer
system vendor based in Columbia, S.C.
Lubasom said the product is

Johnson said the product is fast enough even with eight users to support his graphics-in-tensive scheduling system, which has crippled other mulwhich ass crappied other mu-tiuser systems. But, he added, the product is ideal for three to four users, which is the mean number of users in the compa-ny's product sites. Johnson has ordered 20 packages of the software to incorporate into Co systems' medical systems.

Comperison shopping Johnson said he compared the Alloy product with comparable offerings such as PC-MOS/386 from The Software Link, Inc. in Atlanta. But, he said, because the PC-MOS product addresses m-access memory comcould hardly he called a rival to 386/Multiware, which address-es RAM through IMP cards.

Alloy is currently working on a 386IS product, Johnson said, that will host its own 386 processor and 4M bytes of RAM on each of the IMP cards. The strat-egy, Johnson said, is to boost the power for every group of eight

"We think that they could be used in what

we're calling per-sonal information

with a [compact disk/read-only

memory) player worn on a belt

and a telephone handset on the headset for voice/

dsta applica-tions," he said. Lipsey said that a variety of

vices, Inc., located in College Station, Texas, intends to use Multiware/386 on both Micro Channel and Personal Computer AT-style machines, according to Ted Johnson, vice-president of technical services. He has installed and is beta-testing the NX386E software

NX386E software package, which includes an IMP2 intelligent multiport card that pro-vides ports for two additional us-ers and two IBM 3151 ASCII

In all, this arrangement sup-orts three users and costs

Encouraging news
Johnson said his test results are
encouraging him to implement
386/Multiware as the foundation
for his company a PC network.
"The significant factor about this product is that it allows us to

put more than one user on the PS/2," Johnson said. "I believe that IBM designed the Micro-Channel to support multitashing, but as it stands alone, there is nothing magic about it." Howev-er, he added, "the multitashing is a secondary requirement." Johnson said he will complete testing the product's perfor-mance this week and is so far ased with how it has fan

pleased with now it has taree. But performance aside, he said, when roughly compared with a Token-Ring network, the 386/Multiware product costs less than half to support the me number of users.
The product comes in various onligurations. Prices range om \$395 to \$5,775. The IMP

from \$395 to \$5,775. The IMP multiport cards and IBM 3151 terminals are included in their al-located multiuser product's packaging. The IMP cards each contain their own processor and 640K bytes of RAM.

**End-user** FROM PAGE 45

will be among several technological developments that will drive end-user conjuning indo corporations. Tapacott said.

The computing influence of MIS will disperse. The changing information economics, which will put mainframes on deak tops in the 1990s, will mean that there will be no need for a centered of the control there will he no need for a centralized computing facility," he

But a strong central comput-ing group will still he needed to design corporatewide applica-tions, to develop a coherent data architecture management capa-bility and to introduce new stra-tegic applications, Tapacott add-

William Jarvis, president of The Transition Group, Inc. in Toronto, echoed the view that the role of corporate information services will change as a result of the increase in the influence of

end-user computing.
"By the mid-1990s, every white-collar worker will have a personal computer on his or her desk," Jarvis said. "That is why end-user computing will become a dominant force."

Toking on traditional roles End users will take on some of the traditional roles of informa-tion systems, Jarvis noted. Rather than using resources to con-trol PC purchasing levels and developing small applications,

the IS will devote more effort to developing a technology strate-gy and architecture and coordi-

gy and architecture and coord-nating overall system planning Jarvis said.

End-user computing har reached a critical mass, said Jar Duffy, a partner in the informa-tion technology practice at Peat, Marwick, Main & Co. in Toron-Marwick, Main & Co. in Toron-to. The penetration of comput-ers is nearing parity with the number of office workers. Ead users are knowledgeable about the benefits of computing and are eager to take on the end-user computing challenge, abe and. End-user computing is ex-pected to grow much faster than the next of 15 to a result of com-

pected to grow much faster than the rest of IS as a result of orga-nizational decentralization, in-creased user sophistication and saticipated innovations in huma-ware and software, Duffy said. "End-user computing costs

"End-user computing costs may account for 41% of the corporate IS budget by 1990, up from 30% in 1966." Duffy said. George Sekely, vice-president of computers and communications at Canadian Pacific in Tonto, urged members of the audience to strengthen their

commitment to auto commutment to automation.

He suggested that MIS managers allow their end users to communicate directly with the corporation's information. MIS must avoid becoming only as intermediary, as a travel agent is

today on an airline reservation system, Sekely said. "Tomorrow, the end user will he the person who wants to fly.

#### Private Eye

front of one eye and tricks the brain into thinking that the dis-play's images are floating about two feet in front of the viewer. The company said the imag is equal in size and resolution to a 12-in. CRT. In the current mod-

el, the display coloring is red on

Reflection Technology de-clined to reveal how the display operates, for fear that competi-tors would rob the company of its technology before it could he

Steve Lipsey, vice-president of marketing at Reflection Technology, envisions that the device will be used in a variety of products, in which portability and full-size displays are needed. The Private Eye could be d to replace the single-line

ucts could be introduced as early as Comdex/Spring '89." Lipsey Video-game companies are especially interested in the tiny dedisplay of a pocket calculator or vice, to be used in a new generapager, for example, with a full-size screen, Lipsey said. tion of games with three dimensions or other special ef-



fects, he added. The company plans to market the display "to any company we think can build a product," Lipsey said.

The cost of the display will vary between \$100 and \$500, depending on the quantity, he

Some large manufacturers of consumer products may be able to acquire the display for less than \$100, he added.

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#### Barnev

CONTINUED FROM PAGE 45

king is just not worth the buci One user suggested an alternative. Have the employee keep the low-end system and give out bonuses for extra work.
That's how you boost productivity

ently complained about the sorry state of scal-area networking. These LANs are fine for stringing together large number of personal computers. But for groups of four or five PCs, it just isn't worth the trouble. This person was looking for a ap, easy way to let small groups of us

That's when it hit home. Maybe PCs aren't so great after all, and maybe si ing processors isn't so bad after all. At Computersorid, we have a shared-pro Computersorid, we have a shared-pro-cessor system. Need to send a file to your bosa? No problem. Want to read it at the same time! If MIS lets you, you can. Want to send a message? Piece of cake. And our technology is considered by some to be hopelessly out of date. It won't run Lotus' 1-2-3 and it isn't 32 bits, but it does the job it is supposed to do rather well. Try that with PCs, and you might just enter the network nightmare. Some of these systems are too new to be as reliable or effective as shared processors.

So let's keep charging after better

micros and better networking. But let's keep the large-systems vendo

on more cost-effective shared-processo sarticularly for small work alternatives, particularly for small wor groups. They may find a willing and re

Keep it complicated, stupid! There has been a lot of yaking gloot making the control of the cont

these folks will shout louder and louder about the lack of technical depth. If it isn't complicated, it won't do the job, they'll

Don't believe it. A lot of sh dors will figure out simple ways to do complex things, and computer manage should welcome this influx. With users more self-sufficient, MIS can concentrate on the true leading edge and the true strategic use of information systems

So that's why people use PCs. Ever wonder why people use PCs? Ken Olsen, who espoused his quirky, iconoclastic and insightful views at a recent press con

and insightful views at a recent press con-ference, obviously has.

According to Ken, there are three types of desktop-device users. Terminals, the most reliable device, are for people who "never want to look at a floppy disk."
They are also for "secretaries who nev-er want to take their fingers off the keyourd and never want to look at more

an 20 lines or so. than 20 lines or so."

And last but not least are the computer scientists, who "have access to everything and want to use a computer just for its own sale." Workstation users weren't really defined, but Olsen admits his com-

any "loves to sell them."
PC users are the most interesting group. PCs are great for people who need software that only PCs can provide. But they are also for those who, when at a party, want to tell others about their PC, Olsen said. Ken doesn't fall for this, though. "I am probably the only mans or who gets his picture taken in his offic without one in the background." he ex-

nined.

Olsen also spoke out against over-enneering of PC devices. "We sometime gmeeting of PC devices. "We sometimes make a mistake and our customers sometimes make a mistake by having technology bugs lay the specifications, ask for everything and (then) the custom-er can only afford a few desks." It is about time a computer vendor stood up and spoke those words.

Decmart. Digital Equipment Corp. used to only sell stuff it made. That was one of the problems with the Rainbow. DEC made its own RX-50 floppy drives that didn't work with anything else, plugged in its own VI keyboard and use its incompatible serial port for printing when everyone else was going parallel.

DEC is starting to learn that some companies can do a better job building disk drives, chips, software and PCs themselves. That is why DEC has announced a stream of agreements to re-sell other people's machines or use other

folk's processors.

So then, next time you go to a big
DEC trade show, don't be surprised if the
loudspeaker blares, "Attention Decmart
shoppers. In side one, we have a special
on database software. Two for just
\$10,000."

Nerd Perfect. At long last comes a software company with an honest name. Called Vapornoth, Inc., the firm markets Nerd Perfect. For close to \$10, users get a blank floppy disk and documentation on how to use it. The firm calls this new approach WYGIWYG, for what-you-get-iswhat-you-got. The company has even signed software distributor Kenfli to car-ry the product. At least there are no bugs!

rney is a Computerworld senior editor, micro

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#### PCs replace CONTINUED FROM PAGE 45

Gantt said he also likes to drop by the learning center to "fool around" on the Mac II, although he doubts he can justify huying one for work. "The more I become

buying one for work. "The more I become involved with the learning center, the more I want to do," be said. "I have to soo myself. There are other things that have to get done." The computer learning ment with the Ground Systems Group. Mary Howlett, manager of information ment within the Ground Systems Group. Mary Howlett, manager of information for the learning center. The center consists of the trianing center, which holds consists of the training center, which holds calculate and as peculiar events, and the advanced of the training center, which holds the better house, and a peculiar events, and the advanced of the source of the source

The learning center was consolidated at its location earlier this year. Since the summer, the training-center side is busy with classes and other special events eight hours each day. Use of the demo room is still sporadic, but Howlett said she expects the volume of visitors to increase as more equipment is brought in. The demo room is always staffed to ensure

Fully equipped Currently, the room is equipped with IBM Personal Computer ATs, Personal Sys-tem/2 Model 50s and Macintosh SE PCs. Also, it houses an IBM Proprinter XL, a Hewlett-Packard Co. Laserjet and an Ap-ple Laserwriter printer. Howlett is look-ing into acquiring a Compaq Computer

ing into acquiring a Compaq Computer Corp. Designo 386. Each quarter, the training center of-fers more than 12 classes, most of them taught by Howlett's staff. Among the subcugan up Howett's start. Among the sub-jects offered are "Introduction to the IBM PC" and "MS-DOS: The Essentials" for the first-time user. Advanced classes in-clude database and graphics classes for both the IBM PC and the Macintosh.

#### IBM offers aid to hearing-impaired

Speech- and hearing-impaired computer users can communicate more effectively with the aid of a new product from IBM called the IBM Personal System/2

The product is designed to boost the effectiveness of speech therapy provided by speech pathologists, special education eech sounds are entered into a per-

Speech bounds are entered into a per-sonal computer by means of a microphone and are then digitated and storred for anal-yas. A loudspeaker and animated displays provide sural and visual feedback of spe-cific attributes of speech such as pitch, loudness and timing. dness and timing. End uners with speech disorders can

and users with speech universe can use the product to practice and master concepts for building awareness, speech skills and patterning, IBM said. Speechviewer, the accord product in IBM's Independence series of tools for us-

rs with special needs, is designed for use ith IBM PC-DOS Version 4.0 on a PS/2 Model 25 or 30. A complete package, available as the seechviewer Convenience Kir. is school

eechviewer Convenience Kit, is sch

Also during each quarter, MIS issues a tailog of courses to users within the round Systems Group. At the start of each quarter, there is a waiting list of be-tween 400 and 500 users, which results in a four-week wait for most classes. The center is able to acco

center is able to accommouse most use by the end of each quarter. Most of the classes are completed in one day and must be approved by the stu-dent's supervisor. Classes are deliberate ly small so that only one or two students

re a computer share a computer.
"Everyone in the classes is on a similar learning plane so that I've always felt comfortable in them," said Patty Ward, an executive secretary. "Afterward, you can run down to the center and pester the teachers if you have a question." Ward's HE MORE I become involved with the learning center, the more I want to do. I have to stop myself. There are other things that have to get done.

HUGHES LEARNING CENTER USER

supervisor has encouraged her to spend time at the center. The center sponsors other activities including users groups and offers them space and equipment for burktime and other wastiment.

and offers them space and equatriem. nu-lunchtime and after-work meetings. Speakers from vendors like Apple and Microsoft Corp. have also conducted demonstrations of new products. An Ap-ple representative conducted a session on

Hypercard, a program that enables users to write their own applications for the Mac, abordy after its introduction. Howlett and her staff developed the curriculum from close contact with 'technical representatives,' who are key users within each of the group's devisions. "They are the people in the divisions who support the users," Howlett using



#### TI's new TravelMate" LT220. It's the closest thing to carrying a VAX" in your briefcase.

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being there when you freed remote access to your company! VAX.

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The terminal communicates at 1,200 or 2,400 bps through one of its optional inter-nal moderns. For hard copy, just slide the LT220 and one of its optional cradles to add an ink-jet or thermal printer. New credit-card-sized memor

you create, update and store files. They're also hands for constraint the LTZ20 to

your specific application. Like its Silent 700" pro 7220 sets new standards for portabil mibility and reliability. All of which ever wished for a VAX in their briefcase. In short, this may be the best little terminal in

he word. So go ahead. Take the first step toward inproving your productively today. Call foxes frustruments for more information or range a demonstration of the LT220. ne toll-free, 1-800-527-3500.

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# NETWORKING

### DATA STREAM Patricia Keefe

# E-mail weaknesses irk users

EMA panel details pressing need for generic mail gateways

### Playing cloak and dagger



and just spit out its support plans, if any, for Mi-crosoft's OS/2 LAN Manager. Little dribs and drabs of hints and obfuscation have trickled out over the last year via this user or that publication, usually followed by denials. It's a very irresponsible way to deal with one a customer base, particularly those trying to develop some

long-term plans. According to IBM Austin's Mike O'Dell, Microsoft's Named Pipes applications program-ming interface "gets a heck of a lot more attention than it de-serves; there is nothing exceedingly wonderful about it." The real issue, he said, is interopera bility between IBM's OS/2 LAN Server and LAN Manager

LAN Server and LAN Manage based servers. Moreover, O'Dell said he would 'love to clarify the confusion." So why the closk-and-dagger routine? After confirming that Named Papes is in IBM's OS/2 Standard Edition 1.1, O'Dell noted that it is not documented (why?) and then stressed he's not announcing snything. He shio declined to say whether Named Pipes would be support-ed in OS/2 Extended Edition. Continuing this dance further, he said, "It's not whether we'll in-nounce it Named Pipes!, we've got to make sure that we've got Continued on name 69 d that it is not documented

BY PATRICIA KEEFE BOSTON — Already en-trenched in much of corporate America as a desktop productivity tool, users today are demand ing help from vendors in their ef-forts to turn electronic mail into

a competitive tool. While speaking here at the re-cent Electronic Mail Association's (EMA) conference, representatives from a number of Fortune 500 firms bemoaned a pressing need to be able to mes-

sage business partners using CCITT's X.400 gateways between in-house E-mail systems. Currently, these users either build customized gateways or opt for mailboxes on public netopt for manocoes on punor net-works. Some resort to daily overnight mail exchanges. The X.400 gateways promise to resolve multivendor E-mail

messaging and integration head-aches. But while early offerings conform to the X.400 standard, they are not compatible with each other, said Gerald Brown, a senior systems analyst for corporate information systems at

100 PERCENT OF SITES

Eastman Kodak Co. in Roches-ter, N.Y., and James Burridge, a senior systems analyst at the Management Systems Division of The Procter & Gambel Co. Brown and Burridge are respon-sible for massive E-mail systems, ternally developed packages.

Vendors are listening
"The theme I'm hearing from
users is that vendors really need
to work together to make sure
that their X-400 gateways interoperate," said Brown, who add-ed that there is evidence that

vendors are listening.

That they do listen is critical for installations such as Du Pont Co., where 5 million out of the 50 million messages sent per year cross vendor networks. Another approach calls for

Another approach calls for "genuine" interconnection be-tween public service vendors, such as Telenet Communica-tions Corp. and Tymnet/McDon-nell Douglas Network Systems Co. or MCI Communications Corp. and Dialcom, Inc., said Walter Ulrich, a partner at Coopers & Lybrand.

**Data View** 

In the meantime, Brown ob-served that it is "self-defeating and tedious" for users to have to painstakingly build one bridge at a time between their individual mail systems. This is exactly what Kodak has had to resort to. what Kodak has had to resort to.
Hughes Aircraft Co. made a
conscious decision to avoid hav-

ing one-to-one gateway an-swers, opting to go with prod-ucts from Softswitch, Inc., a maker of gateways. While Hughes still has a series of gateways to contend with, the differ-ence, according to Manager Pe-ter W. Donaghy, is that they are all part of the same system.

Heavily decentralized.

Hughes, too, boasts a menagerie of E-mail systems - some homegrown, some purchased from outside suppliers. Along with Mitel Corp., Hughes plans to add electronic data interchange (EDI) to its mail com-

### UCLA, IBM to link SNA. TCP/IP

### BY PATRICIA KEEFE

LOS ANGELES -- IBM and the LOS ARGELES — IBM and the University of California it Los Angeles' recently kicked off a joint two-year project that reportedly will result in an integration of IBM's SNA with TCP/IP on one giant net-

The \$5 million effort calls for parts of the UCLA campus to serve as a laboratory for future academic and business commu-nications links.

nications links.

UCLA said it is installing high-speed fiber-optic links on campus that when combined with BMF Token-Ring technology, will form the building blocks of the campuswide network.

Continued on page 70

### First telco LAN offering bows Bell Atlantic's file server set to ship early 1989

BY MITCH BETTS and ELISABETH HORWITT

WASHINGTON, D.C. — Bell WASHINGTON, D.C. — Bell Athanic Corp., last week became the first regional Bell bolding company to roll out plans for a customer-premise-based local-area network product. When it ships in early 1989, Lanserver Plus reportedly will link a wide variety of user workstations to either an Ethernet or IBM Token-Ring LAN.

The regional holding company

which is located at the cus er's site, communicates with Langate via an interface with the AT&T Datakit switch located at Bell Atlantic's central office. A

Bell Atlantic's central office. A gateway enables Langate users to connect to Ethernet LANs at 19.2K bit/sec., the vendor said. Continued on page 69

· Ready, set, go OSL Page er hookup. Page loy devises PC si em. Page 73.

# FOUR GETS YOU 400\*PRINTER CONNECTIONS











### First telco CONTINUED FROM PAGE 65

Lanserver Plus uses a Digital Equip-ent Corp. VAX to provide file and print-sharing, along with electronic mail services to users on one or more LANs, the

room sant.

Communications takes place via DEC's
igital Networking Architecture, and apications software is provided by Bell Atntic subsidiary Technology Concepts,

Inc.
Lanserver is the first product to result from the government's decision to allow the Bell operating companies to integrate the resources of regulated and unregulat-ed subsidiaries, according to Bruce Gor-

don, Bell Atlantic's vice-president of mar-

It has also left at least one network an-alyst somewhat puzzled. The announcement "really doesn't make them a ger al-purpose network supplier," said David Terrie, a consultant and president of Newport Consulting in Salem, Mass. "It's not obvious to me why you would use them instead of DEC, except perhaps for

service and maintenance agreements."

Moreover, Terrie suggested that personal computer-oriented users should opt

"On the higher end, I'd find myself a hotter box with better price/performance than a VAX," be said. Support and service, which is provided rough Bell Atlantic's subsidiary Sorbus,

Inc., could be another point, Terrie said.

Bell Atlantic "may make up for that
with software, but it can't compete with
3Com or even Netware with bundled-in

3Com or even Netware with bundled-in software," be said. Lanserver Plus Release 1 will provide server applications to both asynchronous terminals and microcomputers using Mi-crosoft Corp.'s MS-DOS 3.1, the vendors said, while also acting as a gateway for Ethernet LANs.

All workstations must be outlitted with voice/data multiplexers. The asyn-chronous serial communications port re-portedly transmits data at speeds ranging from 300 bit/sec. to 19.2K bit/sec.

Scheduled for availability in early 1989, pricing for this initial server release

scenario featuring 100 workstations at four different locations and said that con-figuration could cost \$1,300 per user or could be lessed at \$34 per month per

Release II, slated for late 1989 avail-ability, reportedly will provide a gateway to IBM's Token-Ring network, will sup-port Apple Computer, Inc.'s Macintosh and will integrate the Lanserver and Lan-gute network control systems. Network management features will also be part of the passed series. Release II. slated for late 1989 avail

ne second release.

Future enhancement plans call for a Future enhancement plans call for a gateway to IBM's Systems Network Ar-chitecture and Personal System/2s, proprietary E-mail systems and Integrated Services Digital Networks, Bell Atlantic

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devices. And adding a KMW VP-10 graphics processor lets your mainframe drive raster output devices.

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Twinax protocol converters. KMW also manufactures protocol converters for use with IBM System 34/36/38 computers. KMW's Twinax erter lets you make the most of y System/3X, by allowing communication with ASCII printers, CRTs, PCs, and

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# HP licenses Apollo's NCP

BIT BLAST

Hewlett-Packard Co. has become the latest major computer vendor to license Apollo Computer, Inc.'s Network Computing System. HP said it is evaluating how to implement the distributed ap-plication obtform on its Unix-based com-

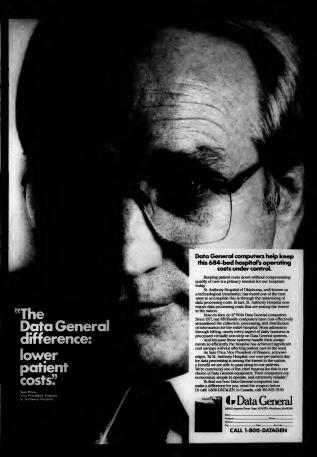
While speaking at the recent National Re-search Council symposium, Sen. Albert Gore (D-Tean, Jeide for the construc-tion of a federally funded high-speed fiber-tion of a federally funded high-speed fiber-optic network to connect U.S. supercom-puters. Gore described the nation's hand of supercompaters as an untapped re-source and compared his plasmed network. In the contract of the contract of the contract of the state governments could bald interest.

Motorola, Inc. announced that it w Motorola, Inc. announced that it would participate in an Integrated Services Digi-tal Network (ISDN) trial with Northern Telecom, Inc. and regional Bell holding company Ameritech starting in early 1989. Both Ameritech and Motorola hope 1999. Both Americch and Motorous nope to come out with ISDN equipment and services within a year. According to Ameritech, the trial will explore using ISDN to connect different areas within a business enterprise.

Timeplex, Inc. has provided a new user interface said to make it easier to operate its Time/View network-management workstation family. The interface features mouse-driven color graphics and pull-down menus. Different aspects of the network can be brought up in multiple windows, the vendor said.

10Net Communications, Inc. will demonstrate Digital Communications Associates, Inc.'s Select LAN Manag-er OS/2 software at Comder/fall '88 next month. 10Net users will be able to attach DOS workstations to DCA's Select server by the second of the contraction.

Hayes Microcomputer Products, Inc. said it has developed a Multi-Copy Software Licensing Program for its Smartcom products. The program en-ables users to make 10, 100, 500 or 1,000 authorised copies of the Hayes software for use at any user location, not just at one



# Firms forecast OSI migration plans

Y ELISABETH HORWITT and PATRICIA KEEFE

Following nearly a decade of preparation, a number of firms are gearing up to migrate to the Open Systems Interconnect

The New York-based ac ng and consulting compony recently released the results of a survey of 122 attendees at the June Enterprise Networking Event (ENE). More than 65% of the respondents said they plan to start implementing OSI within

Among the busin anticipating the most OSI activi-ty within this period are the automotive manufacturers and surance companies. Amon e former, 57% said they woul

On the drawing board



1991, while 43% said they wou be in the process of implement-

50% of the respondents said they planned to have OSI sys-tems up and running by 1991, and another 33% said they would

be implementing such syst The rest of the respondents break down as follows: 72% of cturers sa hey would be in the process of implementing OSI by 1991; gen eral manufacturing brought up the rear, with only 6% of respon-dents planning to have OSI in-stalled by 1991 and only 14% exting to have impl

lans by that time.
It should be noted that the ers do not nec above numbers do not necessar-ily reflect OSI plans for the in-dustries in general, since ENE dealt primarily with OSI prod-ucts and vendor strategies and naturally drew users already in-terested in the standard.

OSI implementers are leaning heavily — 64% — toward exe cuting the standard on both lo cal- and wide-area networks, alough 33% said they would plement OSI solely on LANs. Despite fermenting OSI in

stallation activity, some user needs have yet to be addressed by the standard, Coopers & Ly-

brand said. For example, 70% of respon-dents said they would like an in-terface between OSI and IBM's

Systems Network Architecture (SNA). IBM has asnousced, but not yet delivered in the U.S., OSI-to-SNA gateways.

VER THE next few years, OSI will emerge as the only seus alternative to IBM's SNAL"

> PAUL NELSON VENTURE DEVELOPMENT

Finally, the lack of in bility between OSI and other etworking environments, such as Transmission Control Proto-col/Internet Protocol, was of ra to 37% of the w

gration path from other environ-ments to OSI (23%) and a lack of est protocols (17%).
"Over the next few years, OSI will emerge as the only seri-ous alternative to [IBM's SNA]," said Paul Nelson, a networking consultant with Venture Devel-opment Corp. in Natick, Mass., which is also tracking OSI de-

However, he cautioned users sceking to migrate their systems to OSI that OSI is only as valuto USI that USI is only as valuable as the business solutions wrapped around it. "It's what you do once you have an OSI-based platform implemented that determines how well or to

what degree different vendors' uters can be integrated. Another issue, accordi Nelson, is the OSI software that resides in host computers. "This

consecution, intensive and very complex side of the total OSI equation," he explained. Conversely, Nelson notes that the relationship Conversely, Nelson noted that the relatively cheap part of an OSI implementation lies in the the bottom four layers, and in some cases, all seven layers. These products, coupled with

ment in silicon technol dity over the next few years, be cli dropping prices, in turn, should encourage the resp move toward implem

# It's About Time You Means To Effectively Manage

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### Wollongong unveils first members of OSI family

BY MITCH BETTS

PALO ALTO, Calif. - The Wol-MALO ALTO, Calff. — The wo-longong Group, Inc. recently un-welled the first two products in a family of Open Systems Inter-connect (OSI)-based networking toftware for Unix-based sys-

Wollongong's OSI line --WIN/OSI for Streams -- is primarily aimed at government and commercial users who are startcommercial users who are start-ing OSI pilot programs, as well as OEMs that are building OSI-compatible products, according to Dan E. Ladermann, Wollon-gong's vice-president of ad-

gong's vice-pression of avvianced programs.

The first two products are WIN/ULS, which provides protocols for the upper-level services of the OSI Reference Model, and WIN/FTAM, an implementation of the FTAM

protocol.

The WIN/OSI family is modular, so users can choose only the pieces they need or can afford.

Ladermann added that the technology, which is intended to

Transmission Control Protocol/ Internet Protocol (TCP/IP) to OSI, allows WIN/OSI modules to OSI, allows WIN/OSI modules to run on top of a TCP/IP founda-

Pilot projects
Although the TCP/IP market
will continue to grow for the
next three to five years, some

said.
WIN/ULS implements Levels
5, 6 and 7 of the OSI model and
reportedly can run existing
TCP/IP or OSI transport protocols. WIN/FTAM allows users to odify and manage — not just ransfer — files on remote, disar computers, the ven

WIN/ULS and WIN/FTAM each carry a price tag of \$615 and will reportedly be available

in January.

The WIN/OSI for Streams family is said to work with any AT&T Unix System V Release 3 Streams environment, according to Wollongong.

### Keefe

the appropriate level of work done around it." Huh?

is on the way. LAN Server is ex ss on the way. LAN Server is ex-pected to emerge from its va-por shroud within the next two weeks, along with IBM's 16M-bit Token-Ring and some micro-to-mainframe software. At this point, IBM will have to officially

announce something docu-mented that has received the right amount of work.

Pruit salad anyone? You knew Novell was going to pro-test the Microsoft-sponsored benchmark of its LAN Manager vs. Netware running over DOS. But those Red-heads from Utah But those Ked-heads from Utah do have some good points. It's a bit strange to benchmark an OEM product against an enduser product. Couldn't Microsoft have tested 3Com's 3 + Open OS/2 client software against Novell's Netware OS/2 client soft-

On the other hand, most On the other hand, most benchmarks are essentially rigged. The point is to play up the best feature of your product And there are those who think Novell doth protest too mach. After all, 3Com has found more than a little fault with some pre-vious Novell benchmarks. This broubaha is just one

more reason why users should turn their backs on vendorfunded benchmarks. The best benchmark for any user is a test-run on the targeted in-house system. Test the product and then do your darnedest to

HE BEST benchmark for any user is a test-run on the targeted in-house system.

Waving the Proteon flag.
The Proteon Users Group
(PUG) held its insugural meeting two weeks ago in Boston. A
gathering of approximately 65
users elected Bob Rodgers as
president. Rodgers is a technology planner specializing in tele communications and network-ing at Chrysler's engineering

either Rodgers — who warn he's hard to reach — at 313-956-3525 or Suzanne Barcla

Top-down development.
This past year has seen a host of companies come out with low-end versions of their more sophisticated offerings. Even as the industry leaders in networkthe industry leaders in network-ing race toward ever more complex and far-reaching com-munications, it seems many more are heeding the siren call of market opportunities. Pundits have estimated that less than 5% of the LAN market has been

tapped.

Expect this second wave of LAN users to focus on highly user-friendly products that an easy to install and manage.

Covering the bases. Look for Netware on the shelf next to 3+Open in Radio Shack stores shortly. It seems Tandy has en-countered a demand that if feels it can't reduxe, sources say Unwilling to lose hardware sales tied to Netware, Tandy re-portedly shready has some field rees installing and supporting reps installing and suppo Netware. The company

Keele is a Computerworld senior o

# r Company Had The ne Of Its Most Valuable Assets.

whether they're traditional, 4GL, CASE or DBMS-based. The ENDEVOR software management system provides for:

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ark, 114 Turnpike Road, Westborough, MA 01581-9990 NOVEMBER 7, 1988

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organization's application systems and are interested in improving the

quality of production turnovers, software distribution, vendor applica tion updates, software documentation, application stability, cha

### E-mail FROM PAGE 65

lex. As EDI provides a means r business partners to commu-cate, mail vendors may soon find themselves under pressure to also provide support for ANSI's X.12 standard for EDI.

"Users want to know how to merge three different mail prod-ucts into one directory," Brown aid. Kodak has pulled off a similar feature, prompting much at-tention from audience members after the panel session. X.500 is expected to address this issue.

In the meantime, Donaghy cites two key contributors to maintaining the growth of E-mail within large corporations: ease of use and reliability. "We need to work on stable, reliable, consistent and cost-effective sys-"he said.

He cited a change made in Hughes' internally developed mail system, PC Office, which alows users to automatically pload, distribute and translate documents between mail systems at the touch of a single

"When we put that in, we saw a huge jump in the use of elec-tronic mail and document ex-change. Before, it wasn't used

much because it was too cumber-some, "Donaghy explained.

Many firms have already suc-cessfully sold the benefits of E-mail internally. "So now you have lots of people depending upon it, and you'd better make

sure you have a reliable and stable service or you're going to have some very upset u

It will take time and effort, but one way to do this is to set up an expert system to assist in automating processing and monitoring of all the mail that is gen-erated. Another avenue is to encourage vendors to build th type of monitoring into their mail

### ABCs of E-mail

be following are the dos and don'ts of selecting p, sonal computer-based E-mail packages. Originated Baster Healthcare, Inc., these guidelines were adop ed by CC-Mail, Inc., a developer of mail software, as presented at a recent EMA panel.

sk references carefully. Ask to speak to other users, terstand your requirements and plan for future co

nectivity.

• Do look for a package that is easy to learn and use and that features pointers to a central database, encryption and cleans on and disaster utilities.

» Don't use network-specific usal pachagas. Users more consistent of the contract of the contr

the number of users taming avvainage or their company a mystems was well beyond original projections.

• Don't buy whistles and bells. Most users don't use them, as cording to CCA4sil.

• Don't change your lifestyle. A mail package should fit you environment and cooperate culture, not the other way around.

• Don't judge all PC packages by one. Different packages have different capabilities — examine several.

PATRICIA KEEPE

### UCLA, IBM

A major focus of this study n major tocus of this study will involve connectivity be-tween IBM's Systems Network Architecture (SNA) and Trans-mission Control Protocol/Inter-net Protocol (TCP/IP)-based networks. In what might be seen as an effort to find a home for the IBM mid-range processor, the 9370 is the targeted gateway.

Currently, the extended UCLA campus features a mix-ture of three major IBM net-

works, along with a variety of other third-party networks. The use of different protocols on ed to produce in-depth know edge on network management these networks has made communications among some of

One of UCLA's goals is to de-velop methods and procedures for managing and maintaining a network with multiple protocols. There is a possibility that IBM's custom work with UCLA could yield commercial products For example, integrating SNA and TCP/IP networks into one

and requirements.

Also, IBM's network management products, including Netview, will be used to facilities. tate the school's current efforts to fold its telecommunication and computing orga der one umbrella. Ultimately, the network will

ttend to 10,000 workstat link buildings located on 411 acres, serve numerous off-campus networks and provide several options for accessing supercampuswide network is expect-

# L)H(In

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computer resource management in the UNIX/DOS environment. So call today. Because now more than ever, you need the right tools to extinguish your computer resource management fires and prevent them in the future.

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The scrapheap doesn't have to be the end of the line for all those expensive IBM and ASCII terminals. Because Gandalf has a way to transform their apparent obsolescence into new-found productivity.

It's called StarPort, an option of Gandalf's unique STARMASTER" Hybrid Networking System. StarPort turns any desktop terminal into a powerful PC, providing access to MS-DOS software from

anywhere in your network. SurPort can connect desktops to virtually every computing resource in your network, centralize control of productivity application software and permit access to data only as needed. And because StarPort is memu-driven; it's extremely easy-to-use. But best of all, you'll discover StarPort to be very cost effective, in both short-erm applications and future system expansion. Find out more about Gandalf's StarPort and STARMASTER systems by calling the office nearest you. And keep your current equipment headed in a productive direction, rather than to the scrapheap.



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### NEW PRODUCTS

### Local-area networking

product designed to allow two or three microcomputer users to share files and databases is now ble from Alloy Computer

roducts, Inc.
Called PC-Twin, the product
massts of an Alloy processor
pard and an IBM 3151 terminal ctivity cartri The package also includes a two

ree-user version of the ven dor's Babynet software and is said to run on any IBM Personal Computer, PC XT, AT or Intel Corp. 80386-based class ma-chine using IBM's Enhanced Graphics Adapter, Video Graphics Array or other host video

pripment. PC-Twin costs \$1.695 Alloy Computer Products, 100 Pennsylvania Ave., Fra-mingham, Mass. 01701. 800-

network card that is compatible with Arcnet specifi-cations as well as both bus and tree topologies is being offered by DTK Computer, Inc. Dubbed the PCI-001 Da-

tanet LAN Card, the product reportedly provides data trans-fer at rates up to 2.5M bit/sec. and supports up to 255 nodes per etwork segmen

According to the vendor, a diffied token-passing protocol events collision and loss of ta. Maximum cable length bebus topology and 22,000 ft for

tree topology. The card was de-signed primarily for Novell, Inc. networks but will also work with her baseband systems.
The PCI-001 Datanet LAN Card costs \$195 for a bus-top

ogy compuration and \$145 for a tree-topology version.

DTK Computer, a division of Datatech Enterprises Co., 15711 E. Valley Blvd., City of In-dustry, Calif. 91744. 818-333-

Compex, Inc. has announced a four-port Arcnet local area-net-work controller for the IBM Per-sonal Computer XT, PC AT and

The controller card, dubbed

Net, allows users to build star tworks without stand-alone ibs, the company said.
The product comb Arcnet board and a five-port hub to provide users with four free active ports that can be connect-ed to four Arcnet workstations up to 2,000 ft away. Using inexpensive pr ubs, each active port is addi-

three other Arcnet workstations within 100 ft.

Compex, Unit H, 4075 E. La-Palma, Ansheim, Calif. 92807. 714-630-3382.

Xyplex, Inc. has expanded its Maxacryer terminal family with the addition of the Maxacryer TM 4500.

The product works in o junction with the company's Ad-vanced Network Management oftware and will con 32 users, the vendor said. Of red as an entry-level product vice with local- and wide-area networks for Digital Equipment Corp. VAX/VMS systems. The

erver also supports any system anning Transmission Control The basic Maxserver with an

Ethernet connection costs \$3,995. An eight-port terminal server card costs \$1,395. Xyplex, 100 Domino Drive, Concord, Mass. 01742. 617-371-1400.

Two intelligent multiuser boards for IBM Personal Computer ATs, Personal System/2s and computible machines have been nnounced by Arnet Corp.
The 10-MHz Smartport/2
erial controller board is avail-

selia in either eight or 16-port versions and runs in the IBM PS/2 Models 50, 60, 70 and 80, the vendor said, Smartnort/2

The PC AT-compatible Mod-ar Smartport product is said to be a serial communication.

controller board that incorporates telephone-style connectors. It is priced at \$1,295.

Both boards are scheduled to be available this month, according to the w Arnet, No. 6, 618 Grassmere Park Drive, Nashville, Tenn

37211.800-366-8844 Tiara Computer Systems, Inc. has introduced a half-size Arcnet card that fits into any slot of the IBM Personal Computer, PC XT, AT and computible com-

ters. Called the Lancard/A PC the product features configura-tion switches that allow for full compatibility with virtually all al computers and PC

The card carries a suggested

retail price of \$240 and comes with a lifetime warranty, accord-ing to Tiara.

Tiara, 2700 Garcia Ave., Mountain View, Calif. 94043. 415-965-2677.

Highland Digital is now ship-ping Network License Man-ager. The product reportedly allows networked Unit worksta-tions to share proprietary is-censed application software over an Ethernet network without viting the one-license, one

Network License Manager is a Unix utility that was designed to be built into application devel oper's products and acts as a er s products and account rious application packages

from multiple vendors.

The product also offers support for layered application soft

According to the vendor, the Network License Manager costs \$10,000 for binaries. Source code is avai ed Arcnet networks, the ven

quote basis.
Highland Digital, 940 E.
Meadow Drive, Palo Alto, Calif.
94303.415-493-8550.



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Before Linking PCs To A Mainframe, Think What You Could Be Getting Yourself Into.

Network Research Corp., a Transmission Control Protocol nternet Protocol vendor, has announced its support for the recently released Western Digital Corp. Ethernet adapter for IBM's Micro Chan-nel bus Personal System/2 systems.

The company is offering its Fusion Network Software in a bundle package with the Western Digital adapt-er, which will support Micro Channel PS/2 Models 50 and 60 for the Microsoft Corp. MS-DOS operating system.

An unbundled version of the software is available for \$300. Network Research, 2380 N. Rose Ave., Oxnard, Calif. 93030, 805-485-

A networked version of Wordperfect 5.0 is available and currently shipping, according to Wordperfect Corp. The product includes several features

or network users, such as a master document and document-compare functions.

The master document facility report-

edly simplifies the editing of large documents by combining several files into one, while the document-compare function compares and revises a document on screen, phrase by phrase, with an existing Each network workstation using Ver-

sion 5.0 requires 384K bytes of available memory and DOS 2.0 or higher. The Wordperfect 5.0 personal com-puter local-area network costs \$695 for the file server and \$150 for each addition al workstation

Wordperfect, 1555 N. Tech Way, Orem, Utah 84057, 801-227-4433

Server Technology, Inc. recently an-nounced a proprietary version of its Easy-ian local-area network software for use on Northern Telecom, Inc.'s Meridian SL-1

Public Branch Exchange systems.

Called Ensylan with Meridian Exm, the software will give SL-1 users access to laser printers, plotters, tape-backup units and other shared per

sonal computer resources, according to Server Technology. Files may be transferred across the eds up to 19.2K bit/sec..

The menu-driven program reportedly supports IBM Personal Computers, PC ATs, Personal System/2s and compatible

According to the vendor, Easylan with Meridian Extension is priced at \$199 per Server Technology, 140 Kifer Court Sunnyvale, Calif. 94086, 408-738-8377

### Network management

series of program switches and network cor been introduced by Tel-

tional, Inc. Called the Series 4000 Progr mable Communications Processors, the units are based on Motoroia, Inc.

20 microprocessor tech 020 microprocessor technology. The products employ dual-processo chitecture, and they provide a nodal

roughput of 800 pack The series also offers 256 bytes of on

cache memory and a clock speed of The Series 4000 is priced fro \$38,250 to \$86,150, depending on the

del and the configuration.
Telematics International, 1415 N.W. 62nd St., Ft. Lauderdale, Fla. 305-772-

Micom-Interlan, Inc. has announced a network management package that oper-ates with the company's IB30000 family sternetworking bridg ted on proposed IEEE 802.1 net

rk management standards, the Brid imagement Station reportedly is es a command-script language that alows operators to create configuration ording to the vendor, other fre

quently performed routines in command files can also be stored on disk. The Bridge Management Station soft-

ware costs \$1,295 Micom-Interlan, 155 Swanson Ros othoro, Mass. 01719, 508-263-8655.

The latest versions of Network General Corp.'s Suffer will perform protocol analysis and diagnostics for Sytek, Inc.'s broadband network products, which include the Localnet 6000 and IBM Perronal Computer Network, the two companies

Sytek will resell the Sniffer as part of s product line. One new Sniffer release is id to monitor and collect network protosaid to mountor and collect network proto-col information on Sytek'a 2M bit/sec. broadband PC Network running a variety of protocols, including Banyan Systems, Inc. a Virtual Networking Software, No-vell, Inc. a Netware, PC Network, Digital

Equipment Corp.'s Decnet and Trans sion Control Protocol/Internet Protoc The other version supports Localnet 6000, Sytels's broadband terminal-to-hoet local-area network. Sedifer pricing ranges from \$15,750 for the Laptop 300 Series to \$24,000 for the Portable 500 Series. Add-on protocol interpreters are priced from \$995 to \$1,995. Sytek, 1225 Charleston Road, Moun-

new, Calif. 94043, 415-966-7300.

A family of personal computer-based net-work management systems for the T1 en-vironment has been announced by Coast-

Called the NCC 2 and NCC 3, the sys ms reportedly enable users to monitor, otrol and reconfigure multiple remote Continuo

### TO MOST PROGRAMMERS. **TEST IS A** FOUR-LETTER WORD.

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records every keystroke and host response. Then, when you're ready to play them back, TRAPS replays the test scripts you've selected exactly the way you keyed them in.

Once playback is completed, TRAPS allows you to do an off-line comparison of the expected and received responses—quickly detecting and highlighting even the smallest errors. TRAPS. The Testing/Recording And Playback System

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For more hard facts about HP's approach to computing, call 1-800-752-0900, Ext. 282A. The call is free. The savings could be substantial.

Continued from page 75 Coastcom mult

astcom multiplexers and digital cross-mects via modems and the Public

The NCC 2, designed for smaller point-to-point networks, is priced at less than \$1,000 and is shipping immediately. The NCC 3, with an automatic polling unction for larger networks, is scheduled or delivery in the second quarter of 1989, according to the vendor. Pricing has not yet been determined.

tcom, 2312 Stanwell Drive, Con cord. Calif. 94527, 415-825-7500

rp has introduced computer weapercorp has introduced computer networking and peripheral sharing de-vices designed to help minimize equip-ment expenditures by allowing users with multiple desktop computers to transfer files and share peripherals across a vari-ety of monto equipments.

tites and snare perspherais across a variety of vendor environments.

Focalpoint and Focalpoint Plus are being marketed through value-added resellers and dealers and, according to the company, provide a cost-efficient and effective hardware solution for integrating

ter systems The products adhere to both RS-232C al and Centr serial and Centronics Data Computer Corp. parallel interface standards for con-



ocalpoint Plus

Focalpoint Plus is machine-indeper Focalpoint Plus is machine-indepen-dent and is compatible with all major com-puter environments, including the IBM Personal Computer AT, the Apple Com-puter, Inc. Macintosh, the Digital Equip-ment Corp. VAX/VMS systems and com-puters that utilize the Unix operating

When used in conjunction with existing local-area networks, Focalpoint Plus rertedly removes printing-delay dead-cks and allows support of multiple printrough a single-syste

Both products come with 256K bytes standard buffering memory, which is dable to 1M byte. Focalpoint is priced from \$600 to \$995 unit; Focalpoint Plus costs from \$750

to \$1,175 per unit. Pricing depends upon Wespercorp, 1821 E. Dyer Road, San-ta Ana, Calif. 92705. 714-261-0606.

Torus Systems, Inc. has announced a connectivity software that allows its Tap-estry II network users access to Trans-mission Control Protocol/Internet Protocol (TCP/IP) applications, the com

The TCP/IP implementation report-edly includes file-transfer and wide-area mail capabilities. The software runs on the Torus Ethernet Plus adapter and the Torus Ethernet Plus adapter/MC for

The Torus TCP/IP Workstation

Pack is priced at \$295. Torus Systems, 240B Twin Dolphis Drive, Redwood City, Calif. 94065. 415

594,9336

Pacer Software, Inc. has announced a major upgrade for its IBM Personal Com-puter to Digital Equipment Corp. VAX connectivity software. Version 5.2 of Pacerlink, for IBM PCs, PC XTs, ATs, Personal System/2s and compatibles, lets users on Apr

nputer, Inc. Localtalk networks com-nicate with a DEC VAX/VMS host. The software also provides multiwis terminal emulation for personal com-users on all supported media, the ve

Pricing is based on numb sions and starts at \$2,000 per Pacer Software, Suite 402, 7911 Her-schel Ave., La Jolla, Calif. 92037. 619-454-0565.

An asynchronous local-area network re-director that extends network gateway bilities to stand-alone personal are has been announced by Tech

The Bluelynx/5250 Redirector works in conjunction with the company's 5250 gateway packages in both local and

According to the vendor, up to nine stand-alone PCs and IBM Personal Sys-tem/2s can have access to all 5250' node functions when linked to the network via the Redi

The Bluelynx/5250 Redirector costs Techland Bluelynx, P.O. Box 335 Friendsville, Md. 21531. 301-746-5888.

A personal computer application software that supports multiuser PC database ap-plications on a Digital Equipment Corp. VAX machine has been introduced by Virtual Microsystems, Inc. Called V-Server/Networks, or

VS/NET, the product reportedly allows users to set up one or more of their Microsoft Corp. MS-DOS drives to map into DEC VMS directories on the VAX. Virtual Microsystems, Suite 700, 1825 S. Grant St., San Mateo, Calif.

Xyquest, Inc. has announced a networked version of its Xywrite III Plus word processing package for IBM Personal Computers and compatible sys-

4402, 415-573-9596

Designed specifically for a work g environment, the product supports DOS 3.0 file locking and access restrictions for specific network drives. Spell-checkers, control-print fonts and help acreens are Xywrite III Plus for Networks is priced

at \$795 for the File Server version and \$195 per node version. Xyquest, 44 Manning Rd., Billerica Mass. 01821. 508-671-0888.

An integrated electronic mail and fi le gateway product has been intro by Compfax Software Internet

Dubbed Faxway, the product report-edly allows local-area network users to send E-mail, spreadsheets, word process-The product reportedly runs on IBM Personal Computers and compatible sys-

tems. Faxway software carries a price tag

Compfax, Suite 2574, 175 Fifth Ave., New York, N.Y. 10010, 212-643-9156.

Harris Corp. has announced the Harris Supernet Series, a family of networking products based on the Intel Corp. 80386 processor running the AT. Thurs System Vogerslag system (Far Marris Supernet Super Gateway) is reported to be a high-end personal computer local-area network designed to provide PC communication capabilities

r both IBM Token-Ring and Eth

The Harris Supernet Super Con-troller is an advanced IBM 3270 control-ler that supports both Coasial A and AS-CII devices, the vendor said. According to the vendor, pricing for both the Harris Supernet Super Gateway and the Harris Supernet Super Controller

or on sys n and customer options. Harris, Data Commu sion, 16001 Dallas Pkwy., Dallas, Texas 75248. 214-386-2000.

QMS, Inc. has introduced a communica-tions controller that allows QMS printers to be directly attached to IEEE 802.3 Ethernet Transmission Control Protocol/

ernet Protocol networks. Each Printlink controll oller includes an tel Corp. 80286 12.5-MHz processor, a 20M-byte print-job spooler, a user con-sole and a 315-in. floppy disk drive for soft-ware upgrades. Host software is not rePrintlink costs from \$3,250. QMS, P.O. Box 81250, Mobile, Ala

Commerv, Inc. has developed as Ethernet thin-wire cabling system that in reportedly capable of sending data at 10M bits over unshaleded twisted-pair cable. Components include the proprietary THM-11 Balum, which supports transision up to 750 ft per node on a starwiring configuration for the multiport reporter, and proprietary local-area network distribution panels, which provide connections for us to 100 trans-wire decorated for us to 100 trans-wire connections for us to 100 trans-wire connections.

ctions for up to 100 two-w locations per unit. Panel dimension ns are 7-in, high by 19-

Panel dimensions are 7-in, high by 19-wide by 3%-in, deep. According to the vendor, the product can be mounted in a 19-in, relay rack, and the unit list price of the THN-11 Balun is

The company has also announced the 6 Port Twinax Star Panel for use in the IBM Type 1 and 2 cabling systems. Each panel is said to support up to 42 twin-axial devices and provide total ran-dom access or remote locations to any

The panel reportedly measures 10½-high by 19-in, wide by 3¼-in, deep. The product contains a full directory

According to the vendor, the 6 Port winax Star Panel costs \$200 per port. Comserv, P.O. Box 5205, 550 From-ge Road, Northfield, Ill. 60093. 312-

### Don't Settle For Temporary Relief

### Tired Of The Bandage Approach To Network Management?

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### Flactronic me

Starx Technology, Inreleased a communication uct for the Unix and Xeni

ketplaces.
Called Com/Ment, the pack
age is an electronic mail informa
tion-exchange system that reportedly will provide companie
with an alternative to more com-

plex commercial networks, the company said. The system sent binary and text data and executes remote applications. The product is said to support most popular terminal emulation products and dumb terminals. Com/Ment costs \$400 for an

Com/Ment costs \$400 for an entry-level version. Starx Technology, 1201 Flower St., Bakersfield, Calif. 93305. 805-324-6041. OA Technologies, Inc. has released a new version of its Oatmail software for connecting personal computer workstations to Digital Equipment Corp. mail systems. Version 2.20 is said to provide a PC-based interface to DEC's All-In-1, VMS Mail and

The product is priced from \$100 to \$300, depending on OA Technologies, 1001 Craig Road, St. Louis, Mo. 63146. 314-432-3622.

### Modems/ Multiplexers

NEC America, Inc. has introduced a series of intelligent data communications products. Dubbed the I-Series, the product line encompasses chassis,

controllers, subcontrollers ar modems, the vendor said. The I1000 Intelliger

The 11000 Intelligent Chassis was designed to provide users with central-site control of data communications products. It reportedly can be custom-tailored with the addi-

tion to a continuer to absolutroller, and moderns can be intermined in the same chassisregardless of application requirements. It costs \$1,200.

The 11001 Intelligent Controller is said to link 1-Series data communication products in the system and allow them to communicate. Through the controller, users can set options and modern configurations and test and mositor any other 1-

Series component. It can be connected to 15 other chassis via a dassy chain to provide control for up to 504 modems. It costs \$25. The 11002 Subcontroller provides a communications path from the controller to each subchassis system. Features include password-protected remote-access and channel-control bit orror testing. The 71002 is available for \$1165.

able for \$1.05.

The company has also introduced two stand-alone moderns:
the N2431C and the N2431.

The N2431C supports 2,400, 1,200 and 300 bit/sec. transactions and includes Hayes Microcomputer Products, Inc. and NEC Information Systems, Inc. autodialers, it costs \$695.

The N2431 operates at the same transaction speeds and includes Hayes and NEC autodialers. The N2431 costs \$575. NEC America, Data Communications Products Division, 110 Rio Robles, San Jose, Calif. 95134, 800-222-4632.

Infotron Systems Corp. has unveiled what is said to be the first commercial T3 multiplexer, which will support 45M bit/sec data rates.

data rates.

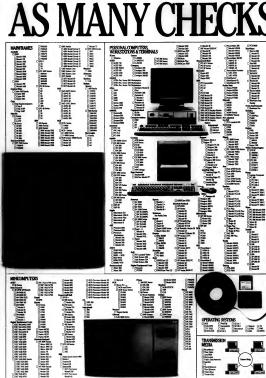
Streamline 45 reportedly supports drop-and-insert communications for up to 28 1.5M bit/sec. T1 links or 672 56K bit/sec

Streamline 45 features hot standby and redundant T3 and T1 interfaces for increased reliability. The product can report-odly interoperate with Infotron's Infostream NX T1/E1 switch and 990NP access product. It can be managed by Infotron's Advanced Network Manager 45 or Integrated Network Manager 45 or Integrated Network Manager.

er.
Pricing for Streamline 45
starts at \$25,000 per unit. Delivery time in reportedly 90 days.
Infotron Systems, Building 9,
Cherry Hill Industrial Center,
Cherry Hill, N.J. 08003. 609424-9400.



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get your choice of ASCII, ANSI or IBM Enhanced PC keyboard styles. There's a 14" flat display in green or page-white with crisp, clear characters in a high-resolution 10x16 matrix. A 2-position keyboard with a true accounting keypad, 20 userprogrammable editing keys, and 128 programmable function keys. The 965 can display up to 44

The 965 can display up to 49 data lines, enough to show large spreadsheets or two normal display pages of text at the same time. No other terminal this affordable can do that.

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MANAGING THE NETWORK

# Control of large networks no dog-and-pony show

BY DAVID GABEL

iring constant oversight and

The network, with between 00 and 1,200 locations in the Corp. and other carriers. The backbone is digital, as is, in fact, most of the entire network. It in-cludes, in Welland's words, "a terexchange carrier that there can be. The company couldn't

And as the importance of the work increases, so does the

time, these users must be re-stricted from too much access, which, if granted, could result in the compromise of sessitive in-formation. Someone also has to se sure that the network is free from unauthorized entry. In ert, someone has to manage se networks, a role that has come a premier task in the h



### INSIDE

Approaching the intersection of voice, data and video Frank Dzubeck on the changing role of the network manager

Spotting the bargains in overseas communications markets

The role of the co tions manager in a cor to be more of an adi

Now, be can play a major role in controlling costs; be has a major

And as more voice as

coming data communications

networks that take voice and

turn it into data - configuration

management becomes a critical

issue for voice networks as well.

Configuration management

takes into account the actual lay-out of the network, a factor that

ion; he can then deter-

### EXECUTIVE REPORT turn digital — essentially be-

### Managing FROM PRECEDING PAGE

ess responsibility. And as snies become more global, he picks up international respon-sibility. He has become a major yer in the overall actions of

Jeffrey Held, a con Network Strategies in Fairfax, Va., says be has seen

se very things haping in companies. And be says it's so for network

magers. "A lot of network come up gh the ranks," relains. "and they sy not have the casility or the back-ound to deal with top manage-nt. Many of the network

managers that we see are very good technically, but they lack the background to deal with straegic issues."
He says this leads to a kind of sirror-image frustration in sany companies. The top man-

ment of the company says it not get information from the er. The manager, for his part, implains that top management at doesn't understand what ds to be done for the commu cations needs of the com

loads either a portion of the network or the entire system. When any of these troubles occur, the network manager must be aware of the problem, be able to identi fy its nature and determine ere in the naturely it exists Most importantly, the manager must know how to fix the probm, either by calling in vendor

sance, for example, or by can greatly affect the bottom reassigning users to different line, as well as planning. The net-work manager should be aware Once the problem of any changing data communi is diagnosed, taking control of the situacations requirements within the tion is the next step. If mine how the network can best there is a fault in hardmeet those ne

ware or software that someone must fix, the Performance measure-ment. Measuring the network's ager must track performance requires constant monitoring to ensure that it is that repair activity.

Network control
and diagnostics "are
two of the most critioperating as it should, with no slowdowns, and, at the as time, that it is not running idle

cal issues because everyone is multivendor," says Harvey multivendor," says Harvey Hershkowitz, a Caldwell, N.J., network consultant. "More and If performa shows that the network is slow-ing down or that added users have caused some problem at a critical point, it may be time to more, networks must stay oper ational, and the manager doesn't have first I one wendor to go to if olan for network expans in network managem re is trouble While standards for co

erseeing these basic functions nd diagnostics, such as IBM's only scratches the surface. Net-Netview and announced prod-ucts from AT&T and Digital Equipment Corp., are on their work managers are the quinteesential firemen: Telecom cations network priorities and problems require that they are way, equipment to control and diagnose the entire network is always prepared to put out the biggest fire first. And, indeed, not yet available. Instead, mans must track what is going this seems to be where network on. In some cases, a manager management software ncentrating their focus: on tools that make it easy to keep networks running - to identify,

ocate and diagnose problems. Keeping ahead of firea in this kind of environment, oth-er management functions may

much of the time

take a backseat. But if manage are to put some sense into running a cornorate telecommunica. ns system, they need to be able to extend themselves beyond the technical to more traditional managerial tasks, such as organizing, planning, executing and supervising. Networks in use today vary

m simple local-area networ to huge wide-area networks involving leased lines, packet-switched data lines, fiber-optic sense to centralize the control of the center for his company. Lusk oversees an SNA network that involves about 300 locations. He backbones, IBM Systems Network Architecture (SNA) netsays Frito-Lay keeps the net-work standard simple because it rks and dial-up modern acce to a central computer. Networks handle voice and data communihas good control over the hardcations in a variety of ways, inware in both company her ters and remote locations. chiding leased Theoreter multied voice and data channels. "We got into this business when PCs just started hitting the communications links and even very small-aper-ture terminal (VSAT) satellite

kind of made it easy for (the us-ers) to order their equipment through us. They need host-file access, and we essentially sell communications systems, which provide relatively inexpensive ons services to private that to the field departments. We In most organ

hicle for network control has evolved into a central organiza-tional entity, typically called the network control center. Indeed, Must-haves rs want from network management systems

Maximized network uptime Low terminal over

V nce manage

Problem determination and diagsent for adds, moves and changes

etion of system responses to alarms

nce measurement for testing remote devices

Standards support: IBM's Netview and the ISO's OSI SOURCE INTERNATIONAL DATA COM ms that there is little local is used from site to site.
"The equipment is so com

agement in corporate telenications networks to day. There is local input at the ning phase of network man-nent, but the actual control centralized. A network control center is

he central location at which the etwork's status is always The people who over the daily management of the net-work work there, and the equinment used to determine the network's ongoing status is housed at the center. The equipment used can be a stand-alone man

agement system or software running within the network and reporting to a central "Our network options center," fland says, "has an

Alan Lusk, network systems anager at Frito-Lay, Inc. in

Texas, says it make

," he says, "and we just

ecause the central MIS or-nation had control of com-

ing hardware from the begi

ride a com

I them for the services.

section ere, when a probiem comes to the onerations center, we can decide where the m is, and we can

Peter Skepsted, tech

manager at the Quan-tum Division of Trav-elers Express, Inc. in Minneapolis, is in-volved in further con-solidating control of his network. Its six packet-switched nodes are in different locas... Washington, problem is, and we can frite-Ley's Luck D.C., to Minneau

mon that we can leverage that

commonsity for the economic good of the corporation," be ex-

plains. "If you compare the eco-nomics of the central organiza-tion with having some data

Because Lusk's network is strictly IBM, when a problem ex-ists, control people can deter-

mine the location of the problem and dispatch IBM maintenance

10 in our central location.

rocessing people in each plant, sen clearly it's less expensive to

where the central network control center is located. Quantum operates a private tomated teller machine (ATM) network that provides ATM services for small banks in various locations around the country. Large banks have their own ATM networks, but smaller financial institutions that do not ve the resources to establish ch networks can still offer such networks can stan outer ATM service for customers by using an organization like Quan-tum. Skepsted says managing his network involves common diffi-

culties; the network's nature re quires that be deal with a num "Our intent is to make the des as unattended as possi-," he says, which is why antum is moving toward cen-dised costrol.

dised costros.

But planning for this move is some matter. "We have a for mal structure for planning,

Looming concerns Fen issues that give network managers headaches

✓ Migration to new technologies without losing investment in installed equipment. ✓ Migration to OSI ✓ Distributed vs. ce network design

Upper level con ✓ Security and bac empater vs. FC LAN s

fore powerful and automated net of total marsher of tree

SOURCE DYTLEMATIONAL DATACE

Jack-of-all-trades The job of a network ma

quires vigilance over a number different basic functions. ese include the following: rol and diagnostics. A variety of problems can crop up telecommunications the network breaks ports slow down or traffic over-

ager should start thinking in a different way," be says. "He has to think like a businesaman, not like a techie. He has to put himmay not know a problem exists until users call it in.

• Administration. Administer ing the network - deciding who self in the place of the guy he's talking with."

and how many users should have access — is another key role of a network manager. Administranctions range from access control, such as pesswords and access codes, to billing and other chargeback activitie Configuration management. Configuration management.

ent can become a chore, espe-illy when multiple vendors are plying the hardware and software used to run the network

Frito-Lay's Lusk says. "Manufacturing, sales, marketing and distribution all recort to senior managers at corporate seadquarters. Within each functional

port to sensor minagers it conjective fores, we have a conficient who interest, we have a concentrator who interest hose with us and helps do their bounters. The confidence will be a considered by the confidence of the confidence of the construction of the confidence of the confide

Budget appea

been installed in cooperation with Rock-ville, Md.-based Centel Information Sys-tems, a large telecommunications sys-tems integrator; Penrod says there is

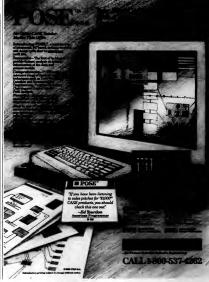
definitely more to do.

"Our final goal is to have all the ful-time faculty and all the classrooms; labs and administrative areas on the network in three to five years," he says. "But right in three to five years, "be any," But right own, our goal is to make sure the network is up and running, which is specially critical for administrative services. We are developing applications that bring a totally integrated system to the user, which, with ease of use, is critical to petting a lot of people to really use it."

However, planning for a telecommunications network involves more than just the continuation of page 30 continuation page 30 continuation page 30.

The investment curve adgets for data communications equipment in the top 1,000 U.S. corporations are spected to double their 1984 levels by 1990





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-Patricia Thomas, AT&T National Account Manager

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# Forget old recipes when mixing media

BY JOSH BRACKETT

signing and installing an integrated to, data and video network for a widespread organization requires expertise in all three technologies, according to Mark Waldschmidt, director of network ser-vices at Science Application International Corp. (SAI). Waldschmidt, who is comting the design of such a network, says, ou can't just talk to experts in each inal field unless you've going to be

the total expert."

And, be adds, if that is the case, you have to be willing to undertake total immersion, not just a surface skim. If you try learning just enough about a couple of the specialties to be able to oversee others on se parts of the project, the system can

NY COMPANY considering voice, video and data integration must keep an open mind.

wind up costing too much or not working SAI is an \$800 million research and de-looment firm that also does avatems in-

egration, mostly under contract for the

The company has 9,000 employees: about 2,200 work in each of its two hub offices in McLean, Va., and San Diego. nd the rest are stationed in 175 field of-ices located near federal agencies hout the country.

Two of SAI's biggest current sys egration projects are a \$500 million stem for the Department of Energy's nuclear waste program in Nevada and a \$1 billion medical information system for the U.S. Department of Defense's hospi-

It was SAI's own experience with uni-fying three separate streams of network traffic that got it started in the network egration business.
"What started as 'Let's network a

things' advanced itself strategically into an important part of the business." explains Jeff Smith, vice-president of telecommunications at SAI.

But before SAI could capitalize on its knowledge of the integration business, it learned about integration the old-fashioned way — by doing it itself first. In

dight, Smith says, any company con-ering voice, video and data integration

"When you put something like this in, don't limit your horizons on what you can put on there," be says. "You can start olding at some of the strategic parts of ur business if you have a facility or an infrastructure in place to do that. That's what we really wound up getting out of

Keeping the door open for additional

Brackett is a free-lance writer based in Rockport.

### growth is also key

"Understand the strategic importance of the network and don't limit your ability to grow the network, add new technol-ogies and add more users," Smith says. "We wound up using the network in a variety of ways that we originally didn't plan for. And had we limited ourselves in the way we designed it, we would not have Four years ago, Waldschmidt and his colleagues realized that they were either installing or adding to separate communi-cations lines for two data networks and

We were going to have to have three different communications lines, separate 9.6K bit/sec. lines for each of those appli-cations. But none of those applications really needed all that capacity," he says.

The early stages
The network began to take shape in 1982
after SAI installed an IBM 4341 mainframe in a new data center in Mis ley, Calif. The new center was 15 miles from its San Diego headquarters, where most of the data was to be entered. To support remote terminals, dedicated

into IBM 3274 com

Soon afterward, Waldschmidt and his colleagues began looking at the future of SAI's MIS department, which handles the company's financial, human resources and review management information.

d project management information.

The company decided to decentralize as MIS grew. To eliminate paper forms, data could be captured close to the source, they concluded. For that purpose, a large communications network was

The only question, Waldschmidt says, was how to implement it. "How do you support terminals coming in from all over the country to a central 4341 near San Most of the company's major locations

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developed by Chemical Bank has resulted in a 30-fold productivity increase The Commercial Underwriter's Environment developed by

Swiss Re Services automates decision making by reviewing, several screens of data, gauging the level of risk, and recom-mending whether potential clients should be insured.

e using Digital Equipment Corp.

were using Digital Engaperson way.

VAK for technical computing.

"The bot item at that time was Decent," Waldschmidt recalls. "So we were gaing to connect the VAXs using Decnet, put an IBM gateway in San Diego and the 'set host facility of Decret' to route users through to the IBM mainframe. The USM materials with the routpool conversion. IBM gateway did the protocol conversion from ASCII to EBCDIC.

### The tricky part One of the trickiest asc

One of the trickiest aspects of designing a network, Waldschmidt discovered, was working with users — trying to predict what they are going to need and when

"They really had a hard time telling you that," he says.

NE OF THE trickiest aspects of designing a network, Waldschmidt discovered, was working with users trying to predict what they are going to need and when they will need it.

As SAJ get used to the setwork, emphasis atherfore MSIS to the consuma-phasis atherfore MSIS to the consumary and classes is electronic and and elec-cations needs of the company profes-sionals, which include managers. The criginal Decret was made up a definisher tools, which was a support of the company of the editor of the company of the company of the company of the editor of the company of the company of the company of the Team, Binstrolle, Ala, La Jola, Cald, and San Depas, it come became evident

anned in a variety of disciplines.

These staff members, expecially those
the two main hubs in San Diego and
icLean, needed to be able to communi-

that one set host procedure took up most of the capacity of a 9.6K bit/sec. line, de-

se time for other users u

ceptably. With 60 to 100 res With 60 to 100 remote users signing on at one time — and the possibility of as many as 30 at once — SAI needed other ways of getting into the IBM mainframes, now located in McLean and Hantwille as well as near Sai Diego, Furthermore, for data entry, a clear bisynchronous IBM extensible to protocol conversion. While the data networks were being bailt, SAI had been developing a thard coast-to-coast communications network.

est-to-coast communications network

r in-house videoconferencing. At the outset, the video setup was afte primitive. The system only transquite primitive. The system only trans-mitted still pictures, which took about 90 seconds to send.
Today's system transmits high-quality video and audio. Meeting attendees, re-gardless of where they're located, see

two large screens with full motion



compressor removes some of the redun-dancy from the video signal so that it re-quires only a 56K bit/sec. line to transmit rather than the usual 70M bit/sec.

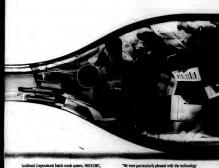
als are sent via 2.4 small-aperature ter

oos, commates that the system saves SAI 55,000 a month in travel expenses.
Face-to-face meetings still occur when necessary, SAI bolds one every quarter for more than 100 of its top people. The video system, however, allows those who cannot make it in person to take part.
The company decided to install a S6K bit/sec, cross-country backbone from San Deep to McLean, mixtally supplied by AT&T and currently distributed by West-erru Vision Corp.

Statistical multiplexers bandle the var-ious protocols in use: Decnet, IBM bi-aynchronous and asynchronous terminal traffic. Simplex Dataminer II compression devices quadruple the amount of traffic each 9.6K bit/sec. line coming into the

The next step in the evolution of SAI's network, Waldschmidt says, is to inte-grate voice traffic into it, possibly by re-placing SAI's two VSAT links, which han-

placing SAI's two VSAI limits, which han-die 112K bit/nec., with a const-to-const fiber-optic T1 link that will handle about 13 times as much traffic. Eventually, the amount of voice traffic between San Diego and McLean will be sufficient to justify such a link. For now, however, this traffic is handled by com-



Lockheed Corporation's batch-mode system, MEDCHEC, reduced the workload of medical claims auditors and improve their effectiveness by automatically reviewing all claims and identifying the questionable ones for review

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"With ART we were able to very quickly develop a complex system. The fact that it is available on many different platforms was also very useful to us."

transfer process that Inference's professional services group conducted. Secondly, ART allowed us to not only develop a working system, but to easily port our application from one computer platform to another." Turn Roberts, Gazway Info

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really get ahead. For complete information, call Chris Dow at (213) 417-7997. Or write Inference Corporation, 5300 W. Century Blvd., Los Angeles, CA 90045.

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### Managing CONTINUED FROM PAGE 85

ng the hardware installation. Penrod has to ensure that the data system is easy to use, in addition to making certain that the network includes digital PBXs. The staff also needs training so they can adequately use all the available features,

such as voice store-and-forward.

Planning also involves deciding how
many people must perform the manage-ment work. Chuck Cutler, network communications center manager at Master-card International in St. Louis, oversees a network that consists of dial-up modems connected into various kinds of communiconnected sisto various taxes or communi-cations lines that, in turn, connect to in-terface processors. He has IBM equip-ment on both end points, various long-hual vendors and Racal-Milgo, Inc. and Racal-Mide, Inc. modems. Cutter also manages Mastercard interface proces-sors, located throughout the country, which control portions of the Mastercard and maintained and maintained.

"One of the criteris I have developed," be says, "says that one person can handle a certain number of MIPS. Say that number is 20. Then if I add 60 more end points, I have just justified three more controllers, each of whom can handle 20 [BM] Series/I computers in the net-

ning the optimum number of workers is a critical aspect of a network manager's job. In Cutler's case, he moni-tored his network and observed that its

performance was slipping, which signaled your peak load."

a problem that needed frome. He explains t year and a half ago," he says. "In fact, we

to skp. Actually, it had leveled or slipped slightly. I reviewed my management re-ports and saw that past a certain point, with each addition of equipment, avail-ability decreased. So I just backtracked to the neak and established the ratio of peo-

# ple and equipment from

push into the market.

A watchful eye Cutler's management reports came from gathering data while the network was operating. Such data gathering about the network's rmance is aco shed as much by the people who run the network as

You need to monitor the network all the time to ensure line quality," Quantum's Skepsted says.
GE's Welland adds that m constantly look at the network to make naximum use of the design. In hardware, for example, you want to make sure you don't have a D-4 [channel] bank out there

ownsince was supping, which signated to be considered that needed frong. He explains that his circuit-monitoring "We thought we were managing well a personnel keep track of how the network is performing, but the network cur were overrun with equipment, and then has no rate monitors to warn of a slor we saw our availability start

PERCENT OF DATA CO

Change of focus The emphasis in data co shifting from transmi stion to efficiency



"Over time, the efficiency goes out of a twork," he says. "You have to he aware of it, the way that you are with a car. If you don't monitor your engine, then slowly it won't deliver the same performance it did before. Our people are constantly going back and evaluation the naturate." ck and evaluating the network."

The network will run as long as p use it, and it is in good condition. Efficie with only 10% usage. You need maximum efficiency, but enough canacity, to meet

operation will ensure that operational costs are as low as possible, a real concern for those watching the bottom line. But how does a manager watch out for that? Skepsted says cost control comes

from design and ongoing operations. Peo ple are a major part of the costs of running the network, which is one reason for the prevalence of central manage requires fewer people.

Lusk notes that he controls costs by

centralizing the purchase of equipment.

"We have control there at a fairly high
level," he says. "If a plant manager needs
a new PBX, then part of my group con-

sults to draw up the [request for propos-al], gets the lesse and so forth." Planning, purchasing and design are all

rt of petwork management, but keeping the operations going is just as imporager has to he involved.

"You need a lot of persi tence," Cutler says, "and sometimes, you have to get downright obnoxious. I have monthly meetings with my ers of long-haul services. I have close coopera-

also means supervising usone person can run a net-work by himself. It takes a team of people with differ ent skills — from customer relations to billing and accounting to technical moon tivity issues involved in network opera-tions and can actually design and maintain

Supervising internal as well as external omotion and proper salary administra-

Recruitment and training are key su-pervision issues for network managers, pervision issues for network managers, especially because competent people are hard to find. Mastercard's Cutler says finding people who fit into his network is a difficult task to perform and is a particular problem for his organization, in which the ancial network downtime is a make-or

For example, the settlement be tween banks (at the end of a busin involves a horrendous amount of money," he explains. "An error on our part can cost, because we are responsible for the float [the amount of money found in be-tween banks while transactions are in cess). One mis

Continued on page 93



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### INTERVIEW

# Net managers earn pinstripes

Cost containment is a never-ending battle for network managers, but according to consultant Frank Dzubeck, these former foot soldiers are learning to fight strategically and are gaining rank within the corporate power structure

dent of Comm Architects, Network Architects, Inc., a computer and

 communications consult-ing firm based in Washington, D.C. Drubeck's company con sults with organizations on planning, design, implementation and management of large-scale and management of sirge-scale networks, with a particular emphasis on cost management.

Dzubeck recently spoke with Computersorld Senior Editor Joanne Kelleher about the changing role and responsibil-ities of network managers.

### What is the job of a con munications manager or network manager like

these doys? The skill set of the manager is changing. He's becoming more of a businessman. He is running a complex business with a lot of changing costs, some of which he cannot control unless he restructures the network

associated with carrier services in private networking. Access charges have gone out of sight. For example, out of every dollar allocated to private analog services, we are now spending 50 or 60 cents for access and only about 40 cents for the long haul. And this is going up. What that means is that access costs tend to be very uncontrollable now unless you try to restructure the network

But isn't restructuring also an expensive proposition? True. If you try to restructure the network, you get hit with another whammy — installation expenditures. Installation costs have gone up thousands of per-cent since divestiture.

### There are bypass options, but in certain areas, I may not want that kind of bendwidth. So I'm stuck with the fact that my last-

nk Dzubeck is presi- mile charges are uncontrollable.

### How do you restructe improve your position? As a result of what I just de-scribed, classical multidrop netscribed, classical mutitarop net-works have become very expen-sive to operate and maintain. But on high-capacity, wideband cir-cuitry, where you've got T1 cir-cuits and so forth, costs have been dropping dramatically. I can buy a T1 line for effectively

the cost of five digital lines. VSAT is also becoming more popular in networking struc-tures because they are an abso-lute, unequivocal last-mile bypass. You go from the premises facility, up to a satellite and down to another facility.

So one of the things that communications managers have to do is hybridize their networks to take advantage of the most cost effective methodologies. That can be done incrementally and in ways that don't impact the dayto-day operations

# is it really that easy to do something like that with-out causing disruption? It's not easy. You've got prob-

lems coming out your ears. So you have to do it gradually, he controlled and do one hell of a lot of planning. You can't throw away what you've got, because that is the day-to-day business environment, and you have to implement the new. So it requires a bit of a magician to han dle these migrations.

# When you start exploring all the different options and hybridizing networks, don't you wind up creating more control complexity? Absolutely. What you are doing is creating management difficulis creating management difficu-ties for the sake of cost savings. That's why there is so much

hue and cry over things like generic management systems. Why do people want standards? So they can plug everything in together. Why do they want to do that? It'a cost control.

realistic one?
No. The thing everyone forgets is that there is a whole other ball game out there called profit motivation. The minute vendors become nice and homogeneous, they have nothing unique to sell.

# We've talked about deal-ing with costs that are out of control by restructuring the networks. How about more controllable costs? One thing that people don't look at often enough are changes in volume of use. Businesses

change and activities shift so that an office that might, at one time, have been a very dense traff point may now require a lesser grade of service. Those are the inds of things that you have to

### When people get caught up in cost cutting, it can lead to false economies. Are there economy mea-sures that network man-agers should avoid?

on the basis of cost. Generally speaking, you get what you pay for, and when you jump like that you are taking some risks. You may lose functionality. You may lose restoral time. You may lose quality of service. Those problems may not come up, but you have to consider the possibility. You can't just look at cost reduction alone; you have to take a look at the whole equation.

soot at the wrote equation.

Sometimes people also try to save by going through other distribution channels. Instead of buying from a vendor, they deal with the distributor directly because he gives them a better price break on smaller quanti-

### at's the matter with When you lose direct contact

with your main vendor, you can lose flexibility. Instead of being able to call the vendor and get an extra unit in an emergency, you now have to call the distributor. And his response is likely to be, "Get me my money," This is a particularly impart issue because, in m cases, the last person to k about a new location or addition of any kind is the network man-ager. By the time he's told, he ay have less than 30 days all everything together.

# How about budget infle tors that are overlooked?



don't stop to realize that they may he paying monthly for service on some pieces of equip-ment that come under their budgets. Those costs are buried inside the budget and just keep rolling along even though the technology has moved so far ahead that that kind of coverage isn't really necessary. Equip-ment is now being built with very and also very high warranties on new equipment. So you can actu-ally save money by buying some-

### at what if something

does go wrong? With the savings on mainte-nance, you can actually afford to treat the new equipment as dis-possible in the sense that you can stock your own repair units.

Another good way of containing costs is to negotiate basic or-dering agreements with compa-

However, in order to do that, you've get to have a

pretty good sense of your expon-sion rate.

Either that or you have to be a good nego-tiator. You shouldn't make the assump-tion that a company is going to walk away from business because you say that you will have been supported to the con-traction of the aroun dustaces occasion you say thought. If you are a good negotiator, you are going to negotiate around that and come up with an amisble agreement for both parties.

is their really the network manag-or's Joh?

Some corporations rely on their lawyers to do that, but I think that's a mistake. Lawyers aren't terribly proficient in particular area of technical negotiation. They don't always jution with enances that can gain you an edge in a particular contract or the things that can gain you good bottom-line dollars.

Can you give an example of something that a network man-nager would see but a lowyer would not? It was a low to the work that the would know more about hidden cost structures and prevailing practices. For cample, warrantee are never exceeding that the wood know more than the work of the work

Warranty management is an excellent thing. People don't do enough of it. They assume that everything has got 90 days on it. That's not true. Vendors are selling

on it. I hat's not true. Vendors are selling on the communications marketplace now with five-year warranties on equipment.

It sounds like whot's needed is a cest-centralminest specialist. Are there only organizations of them only organizations out how of that have people dedicated to their fuection?

No. It turns out that that guy is the extended to their fuection?

No. It turns out that that guy is the extended that the fuection?

In this individual who, before, was more or less a technocrate is becoming less technocrate. And extended the things that is the coming less technocrate. And extended the things that is the commission of a basinessem.

is he prepared for that role change? Let's size it, right now people are in more of a furtighting mode than they are in the planning mode. The reason for that planning mode. The reason for that most networking environments are usually workely understanded. It's a high area of growth, and the demands that are placed upon it shays exceed the perso-nel. But there isn't really any choice; you have to learn.

note that there is a communication managers have been dealing with budgets for years. The difference is that now they have to become a little more artistic in their negotiations. They also have to make their models think more about the economic impacts think more about the economic in their more about the economic in the eco

Yes. It is happening mostly as a result of something called competitive advantage

lanning.

The way competitive advantage plan-ing works [is that] a company forms a roup to look at the business it is in and to s how it can get a competitive edge data, communications and technology. Well, no matter what technology it chooses, communications is always a part of it. So the [communications manager] is part of that group and now knows more about what is going on businesswise in the corporation because he becomes part of this implementation methodology.

Competitive advantage planning is important because it can result in increased sales and reduced costs across all sorts of boundaries in the corporation. So, although you spend more on the network,

Are you saying that if network managers can help to increase profitability in this way, it loosens the strictures somewhat on net-work costs?

No. It doesn't loosen anything on that side. What happens is that, at first, top management loosens cost strictures in or-der to make sure the communications manager implements the plan. But as soon as it becomes a tactical and day-to-day entity, they start asking him how be

So when's the good news?

The fact that the communications manager is becoming a much more significant and respected individual, at least in the more sophisticated organisations. When I started in this business, the concept of managing communications was just a very low-level, subordinate entity inside the MIS organization. In the past few years, this has changed. In the long run, with the

commingling of media, where you have video, voice, data and imaging all coming together, it is going to be interesting to see who becomes the more prominent fig-ure as the businessman in the corporation

Are you suggesting that eventually there will be MIS departments that are run by the communications manager?
That is highly probable. A lot of MIS people to manage to make a ""

ple are going to say that will never occur but, after all, the communications manager is the one who ties all of this together. The only thing that MIS does is provide the computer environment that attaches

# A few words to anyone buying networking software like there's no tomorrow.

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### Managing CONTINUED FROM PAGE 90

\$2 and \$5 million. If we dispatch the \$2 and \$5 million. If we aspatch the wrong vendor's maintenance people to a trouble site, we have a real problem. The pressure is high, and it's tought not find people with the competence and career orientation to fin.

GE's Welland says his company also has to look hard for capable employees, but the situation is improving. "A year.

ago, I would have said the personnel situa-tion is really bad. But since Oct. 19 [1987, when the stock market crashed], Wall et has cut back, and there are more ORPORATIONS NEED people who can look at telecommunications as a business. It requires a shift in orientation. I think you just evolve into it."

STAN WELLAND GENERAL ELECTRIC

er parts of the cou used, other parts of the country are ex-priencing severe personnel shortages, kepsted says DP and data communicaoncyneus says Dr and data communica-tions departments are in the same bost. "You need highly qualified people. We look for the best we can get, and then we train them," he says. As a result, the only choice network managers have is to hire and train their people to take over the

Introducing Microsoft

ous tasks of network management, various lease or serverx miliageness, which is not always easy.
Welland says GE does a lot of on-thejob training. "We don't have a lot of comfort level with, nor freedom to send people to, schools," he explains. "There are 
not as many schools as you'd hope, and 
the problem with them is that they either give their students just a little imaging, or

else they deliver an electrical engineer.

"But we do take advantage of courses vendors offer," he adds. "For example, Southern New England Telephone has a listing of courses we can use. It a not as ef-

ming. Learning communications is one ng, while a degree is something else." While the personnel needs of network nagement may be difficult to meet,

management may be discust to baccu-justionated activoric management prod-ucts offer some resist, specifically for the mechanical aspects of the job. They can help the network manager with perfor-mance monitoring as well as with dispos-tic and control efforts. In this way, the manager ensures that his network is run-manical efficients with shough capacity to ng efficiently, with enough capacity to indie peak traffic and with no slowdowns

uct is in the es

but a more complex version."

Products from AT&T and DEC are also expected soon. But even when the best management product is delivered, even when hardware is virtually fault-trenching machines, even when hardware is virtually fault-trenching machines, even when vSATa have taken the place of long-houl terrestrial finds, things will still go wrong.

And that a still when the network man-well-are his now, for his now, for he now controls are well-are his now. For he now controls are well-are his now.

ger will earn his pay. For he now contr

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think you just evolve into it."

This shift in thinking may into the future. Held says that comtions managers will have to deal in ore with a market that is maturing, re-iring those business skills that Welland entions. Welland predicts the merger of data processing, data communi-and other forms of communicatio one information organization. B these possibilities are sure to ma

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# European carriers seek traffic

Low costs aid international voice, data communications

BY LEW ELEENBEIN

For corporate users, the last two years have been a watershed period for interna-tional telecommunications. The cost of most international services has dropped, particularly between North America and stern Europe, and new services have on introduced that have changed the

economics of applications design. In the early 1980s, voice-grade cir-cuits between the U.S. and Western Europe cost between \$9,000 and \$13,000 per month, including local circuits on each end. Higher speed 64K bit/sec. circuits

were available at a cost of \$17,000 to \$23,000 per month and more. Given the limitations that time zone rences placed on the use of such circuits for voice communications, few users could justify such expensive circuits for

More recently, however, European Postal Telephone and Telegraph (PTT) companies and carriers have recognized the importance of providing reliable and economical communications services as a way to attract and hold international busi-

ses in their countries.
While these PTTs and carriers have always competed to some extent for the business of the international user, this competition has intensified significantly. As a result, many have been improving their facilities and revising their country's tariffs to attract as many corporate net-works and communications users as pos-

ction of Intels service (IBS) has produced a major drop in the cost of voice and data transmission service between the U.S. and Western grope. It also provides a transition from the use of traditional voice-grade lines to Integrated Services Digital Network, the wave of the future.

The nature of this transition is to in duce the concept of a corporate network that can handle multiple voice, data, facmile and other transmi exed wideband facility.

When users have a volume of traffic eater than a basic threshold, they will matically decrease the cost per unit of

increased capacity
For approximately 40% more than the cost of a voice-grade circuit, you can get an IBS 64K bit/sec. circuit in aimost every country. And what that extra 40% buys is

rease of more than 500% in the abil-The use of 64K bit/sec. circuits also provides a lower cost per unit of voice or data traffic than does the use of multiple

voice-grade circuits. Determining a circuit's ability to han-die traffic that would otherwise be ser-viced by the public voice and data netvices by the public voice and data net-works is a good way to evaluate its productivity. The circuit a capacity can be compared with its ability to support such traffic during any period of time. In mak-ing such a calculation, a company could

in a president of Lynx Technolo

NOVEMBER 7, 1988

also determine the break-even traffic lev-el required to justify the circuit. Of course, the move up to an IBS 64K bit/sec. circuit is only feasible if it can be

ed effectively. There are differences in the technical standards for communications equipment in the U.S. and in each European country Equipment such as terminals, modern and multiplexers were designed to m local standards in each country. However there is a sufficient number of vendors

country that users should encounter few, if any, problems in operating desired systems and networks.

A company may not find its favorit U.S. device in Europe, but it will surely find a device that will perform the sam functions as well or better. In some coun

tries, such as France and the UK, equip-ment that is available in the U.S. is also available with modified power supply and

Most users will find that existing PTT guiations and policies will not keep em from developing their European networks. This is perticularly true in France, the UK and the Netherlands, where users are given a wide latitude in the use of leased circuits and equipment. One of the most important differences be-tween U.S. and European networks is that in the U.S., there tends to be a unifor-mity between circuit cost and distance. In international networks, circuits of similar

length can vary greatly in cost.

In the U.S., the cost of circuits between different pairs of cities that are all roughly the same distance apart will not

However, the cost of an intercontinen-tal circuit between the U.S. and Western tal circuit between the U.S. and Western Europe can vary greatly. A single voice-grade circuit can cost as little as \$7,000 per month between the U.S. and France and almost \$10,000 per month between the U.S. and West Germany. An IBS 64K bit/soc. circuit can cost as little as \$8,700 per month between the U.S. and France

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and under \$15,000 per month between the U.S. and more expensive European countries. While the currency rate can affect these costs, it accounts for only a small portion of the cost variations in intercontinental circuits. In addition, intra-European and domestic tariffa can vary widely from country to country,

ography, therefore, is not and basis for the cost-con-

scious design of an international
metwork. Circuits from England
or France to other European
countries can be less expensive
or than circuits to the same locations from Belgium, West Germany or Switzerland, regardless
of the distances involved.

Because the cost of transatlastic circuits makes it impractilastic circuits makes it impracti-

cal for most users to run a circuit from the U.S. to each European

country, most users must carefully select one or two locations in Europe from which to hub their networks to other European countries.

Sticking to the rulea While all PTTs and carriers abide by the vast majority of technical recommendations of

regulatory groups, such as the Consultative Committee on International Telephony and Telegraphy and the Conference of European Postal and Telecommunications, there are wide variations in interpreting how those recommendations affect the use of telecommunication facilities and equipment by end users.

of telecommunication inclinities and equipment by end users. Con It is also important to note that some PTTs and carriers include the cost of national circuits in their tariffs for certain leased mi

circuit services.

The simplest way to use a 64K bit/sec, circuit is to use a statistical multiplexer that can bendle a circuit of this sneed and

handle a circuit of this speed and treat the circuit as a wideband data circuit. This is adequate if a company's needs are largely for data transmission or if its voice traffic is already digital. Most users, however, have a

Most users, however, have a mix of analog voice and data traffic between the U.S. and western Europe. Voice requirements peak during afternoon hours in Europe and morning hours in the U.S. Time differences can have a

IME differences can have a tremendous effect on the mix of voice and data traffic demand.

tremendous effect on the mix of voice and data traffic demand. With the introduction of IBS services, a number of vendors have developed equipment that can multiplex a 64K bit/sec. circuit into up to eight individual 9.6K bit/sec. paths, each of

which can be used as a single wice ordate chunnel. Many different multiplexing and connecting arrangements are also supported. In their most complex configurations, multiple voice and data circuits can be utilised, including a mix of synchronous and asynchronous circuits up to 19.2K bitlex. The cost for this equipment is approximately \$40,000 for both eads and can easily be justified on circuits such as BISS 64K high.

in the last decode, equipment was developed ant could multiwas developed ant could multiplex as M1020 voice-grade circuit into two four voice channels. M1020 is the CCITT standard for condition voicegrade lines. This was accomplished by encoding each voice transmission at either 2,400 or 4.8K kit/sc. The voice quality of this setup was clearly poor, and sithough some users found the degradation acceptable, others found the quality too poor to use

effectively.
Today, however, improved sampling techniques and the higher bit rate result in voice quality that is almost as good as ordinary analog connections on the public switched telephone setwork. In fact, many cannot detect a difference.

During the next few years, other countries are likely to introduce IBS-type services, and the economic and service advantages now available between the U.S. and Western Europe will extend to other areas of the world. In addition to fiber-optic based undersea cables, users can also expect higher quality service at a lower cost per unit of



# IN DEPTH

# A new look at languages

Using Function Points, MIS can measure the power of its programming languages

BY CAPERS IONES

ges that you use your shop? Experts have developed many ways of de-

The invention of Function Points in 1979 by A. J. Albrecht of IBM has recently given softwave engineering researchers a new way of evaluating the power of programming languages. The use of Function Points is starting to lead to a standard way of ex-ploring the productivity impacts of languages and other software technologies as well.

tivity Research, Inc. in Cambridge.

have been in use for nearly 10 years and thousands of applica-tions have been measured with them, a surprising by-product of the technique has been ob-served. Empirical observations have discovered that languages

have discovered that languages have varying but characteristic levels. In this instance, the word "level" is defined as the average number of statements required This form of research is quite

their current accuracy is not high.

Recently, after several hun
In the past, the level of a lan-

For example, Cobol seemed to require about 105 noncommentary source code statements int. PL/I seemed to require



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r definitions associated with lanther definitions associated with sur-es have also been viewed as vague insatisfactory — like "procedural" nonprocedural," "strongly typed," sciative" "object oriented" and so

ne ratio of source statements to tion Points can be used for a number rposes, including the following: a ability to size a project, or predict number of source code statements will be required, as early as the re-ements or design phase. e ability to retrofit Function Points to

plication in any language to the equivalent time if the application were written in ome other language.

The ability to measure the productivity of projects that are written in multiple lan-

sages.

Because Function Points are usually
efined during the requirements and eardesign phases, the relationship bereen Function Points and source code
aloes sizing a much more reliable task an the previous method of ad hoc gue

New life for aging software Many companies have enormous portions of aging software, and much of it was written before Function Puints were in-vented. The ratios between Function Points and source code would make it po-

Selected languages and their Function-Point levels

12 tel 1 representa a tou-pouer san	and coulded's passes	o) and o promote and o
Lance Co.	Lorest	The state of the
Low-level default	1	320
Machine language	1	320
First-generation default	1	320
Basic assembly	1	320
Macro assembly	1.5	213
Cdefault	2.5	128
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effort. It would only be necessary to know the source code count and the languages

ane numeric levels of various lan-ages provide a convenient shortcut for overting size from one language to an-her. For example, if an application re-ired 1,000 noncommentary Cobol stements (Level 3 in the table), then it said take only 500 statements in a Level age such as Natural or 250 state ents in a Level 12 language such as Ob-ctive C. As you can see, the average ober of statements required is propor-all to the levels of the various lan-

most one-third of U.S. software is

may utilize as many as a dozen different languages. In this case, the Function Point technique provides a convenient way of both measuring productivity and evaluating the relative contributions of

No simple corollary It is often assumed that there is a direct correlation between the level of a lan-

guage and development productivity. There is a relationship between the two, of course, but it is not a simple, linear one. For most large software projects, coding amounts to less than 30% of the total effort, while paperwork and defect removal costs absorb the other two-thirds. Assuming that a given program is writ-ten in a language that is twice the level of

a similar program — say, Level 6 vs. Level 3 — the coding effort might be reduced by 50%, but the total project might be improved by only 15% because coding only accounted for 30% of the original effort. Counted for 30% of the original errort.

Doubling the level of the language.

Doubing the level of the language again, say up to Level 12, will only provide an additional 7.5% net savings. Once again, the coding is halved, but coding is not a major factor for many of today's large savings.

can be gained by examining the avera, monthly Function Point production rat associated with various language leve as follows: Language Levels 1 through 3 usually werage net productivity rates below five Function Pointsper staff month.

 Language Levels 4 through 8 usually average from five to 10 Function Points per staff month. Language Levels 9 through 15 usually average from 10 to 20 Function Points

 Language Levels 16 through 23 usual average from 15 to 30 Function Point per staff month.

e Language Levels from 24 to 55 usually average from 30 to 50 Function Points per staff month. curate economic productivity rat

statt month. nguage Levels above 55 usually aver-from 40 to 100 Function Points per

Researchers have been studying the ationship between source code state-ents and Function Points for only a few years, so the margin of error is currently years, so the margin or error is cureasily quite high. Even so, the method is useful enough so that publication of the prelimi-nary table — including its notable gaps and errors — may still be helpful. Further research will fill in the gaps and correct

The range of uncertainty with the Function Point level concept is still being explored, and here, too, research is lead-

OR MOST large software projects, coding amounts to less than 30% of the total effort, while paperwork and defect removal costs absorb the other two-thirds.

ing to is teresting observations.

For some languages, such as PL/L, re-searchers have observed only about a

searchers have observed only about a 10% spend in source statements per Faunction Floid. For other imaguages, such as Code, the spend is about plan or mains 50%. Why some imaguages about the two variables and others so constant as most or windle and others so constant as most officers of the control of th

A complete and reliable industrywide A complete and reliable industrywise study of languages and their levels in of necessity a large, multipeer project. A necessity a large, multipeer project. A 50,000 prosects, assuming 10 projects in 180,000 prosects, assuming 10 projects in However, the organizing principle under their projects in the contraction of a periodic table of languages in potentially as usuff, and the construction of a periodic table of dismension is protestially as useful to ofciwer approaching as the periodic table of demension that been to chemical engineering and to

Courtions
The numeric level of a language may improve software development productivity, but there is not yet enough empirical evidence to demonstrate that maintenance will also benefit.

nance will also benefit.

There is some empirical evidence, however, that execution speeds or performance may be inversely related to level. For example, languages above Level 5 may not be appropriate for high-performance, real-time applications such as

#### ". . . Computerworld Response Cards reach our market. I know this because we got 260 cards back right away."

Carlos Cadalao is president of Integrated Systems Technology, Inc., a 10-year old CICS consulting company that recently began marketing PC-based development tools for on-line systems.

The company created the Quick Screen 3270, a development cool that helps analysts design screens for CICS and MS/DC systems — without requiring a programming background. The next step was to determine the best way to reach the burying market for this new tool. And for Carlot, the first option that came to mind was Computerworld.

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"At first we were concerned that we didn't have the resources to do a full market study, but the cards told us everything we needed to know. We got both quantity and quality in terms of responses. At least 20 cards came back from Fortune 500 companies alone

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radar tracking or aircraft collision avoid-

Therefore, other factors besides Function Points must be considered when thoosing a language for any given applica-

tion.
Levels I through 5 contain more than
150 linguages and dislects by actual
150 linguages and dislects by actual
count, and the balls of the world's software — possibly as much as 85% — to
ware — possibly as much as 85% — to
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considered to be the overal domain of general-purpose impagases.
Levels 6 through 10 contains about 85 to 10 contains 10 conta

Object-oriented languages Levels 11 through 15 currently contain about a dozen languages and dialects. These languages tend to average from to 30 source statements per Function

Point. This set is the home for the majority of the object-oriented languages including C++, Objective C, Actor and Smalltalk. The object-oriented concept of inheritance greatly facilitates reusability and si-lows complex applications to be devel-oped from a relatively compact set of

oped from a relatively compact set of primitive constructs.

The object-oriented set in Levels 11 through 15 also seems to be effective in terms of high-performance applications, such as real-time software. These lan-guages may represent a new approach to netware engineering that couples both inguistic power and high execution per-centile.

Levels 16 through 20 tend to average Levels 16 through 20 tend to average from 15 to 20 ource statements per Function Paint. This set includes pro-gram and application generators and in-cludes perhaps 35 to 50 'languages' in this case. 'Images' include genera-tor-input statements. Examples of lan-guages in this set include fields. List. 'To less, Gansa, Packsae, Magee, Express and Transform. These languages are often ef-fective for information systems and transtion-oriented database projects. Levels 21 through 25 tend to average

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HE STUDY OF the relationship between Function Points and source statements in various languages is one of the newest fields in software engineering. The research in this field to date is less than five years old. The preliminary results, however, are intriguing,

from 11 to 18 settlement per Proteins.

The dissi includes ober 20 different lineagues, most of which are specialsized in the error of distincts queeze. Line
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Function Points and source statements in various languages is one of the newest fields in software engineering. The re-search in this field to date is less than five rs old

The preliminary results, however, are intriguing. The industry has long needed a way of evaluating languages that would be both objective and effective; Function Points may be able to meet both require-

As a new discipline, today's use of Function Points is likely to be modified quickly in the light of future research. But the expension factor of Function Points to source statements is leading to a new ave-nue of research and will perhaps result in a new understanding of languages them-





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# Software design: It's all in your mind

Cognitive theorists say design is more about programmers than programs

BY ROBERT L. GLASS hat is software designi n't we have all the lologies and lan common sense now — ask, "What is soft-ware design?"

The fact is that while MIS has talked a lot about de-sign, we have only been play-

guages are not design, they are representations for writing down the design once we get it. Design is something that hap-pens inside the bead, in the brain, and it happens at a speed faster than lightning — although some people's lightning strokes more quickly than others'.

come up with some answers. To understand these researchers' ideas, you may have to loosen your grip on a few no-tions that have become tradition in the short history of software. Quit thinking of external repre-



sentations as what design is all about, and focus on the mental process. For it is inside the mind that the secret of design lies. and therefore disturbing, the process. And that is easier said than done. But with the methods of a generic discipline called "protocol analysis," they have managed to do it.

ware is at least as much about

plan for answering the question, "What is design?" They decided

process. And they have begin to formulate a theoretical descrip-tion of what those designers do. What they first learned was not all that illuminating. They found that design involved the

implementing the plans and cting on the product and the

rever. Indeed, with a little aking of the words, this se quence of events is not much dif ferent from what we call the soft ware life cycle, a thing we have

years. But once the researcher deived more deeply into the spe-cific process of selecting and composing plans, they struck pay dirt. Lurking inside that cat-

The essence of design
The researchers found that soft-ware designers, mentally and at lightning speed, were doing the following things:

• Construction a mental of the contraction of the construction of th Constructing a mental model of a proposed solution to the

problem.

Mentally executing the mode - in essence, running a simula-tion on it - to see if it solved the

 Problem.
 Finding that it did not solve the problem. usually because the model was too simple; playing back the inadequate model to compare it with those parts of the problem to see where it failed; and then enhancing the

Repeating the three steps un-til they had a model that ap-peared to solve the problem.
 What the researchers ulti-mately did was describe a mental

mately did was describe a mental process — a very rapid, iterative process — of fast trial and error. The mind forms a solution to the problem, all the while knowing that it will be inadequate because the mind is not yet able to fully grasp all the facets of the prob

#### · Bill Gates and Gary Kildali do it

#### Rapid mental modeling and simulation

· Failure is just a part of the process

mand knows, must be at the form of a model, because it is going to be necessary to try sample input against the model, run a quick simulation — inside the mind on the model using that sample input, and get sample outputs a still inside the mind—from that

The essence of design, then is rapid mental modeling and simulation. A key factor in design is the ability to propose solu-

sign is the ability to propose solutions and allow them to fail. Indeed, these researchers also explored the problems of people who are not very good at design. Those individuals tend to build representations of a design rather than models; they are

he first step in programming is imagining. Just making it crystal clear in my mind what is going to happen. In this initial stage, I use pencil and paper."

CHARLES SIMONYI MULTIPLAN CREATOR

then unable to perform simulation runs, and the result is that they invent and are stuck with inadequate design solutions. Their designs do not fall often enough in the early stages and therefore may fail completely in the end.

Thus, it becomes clear that devising a model that fails — and analyzing the causes for that failure — is an essential part of successful design.

ure — is an essential part of succentral design.

Each of the previously described metal steps could produce a failed model, one shown to be insedequate to solve the problem. Those failures could lead to more successful models, suggesting that an integral part of success is the ability to fail and to recover from it. That notion has some intriguing implications from the point of view of teach-

> STOP! Can we talk? P/TPF Programmers

ing design — or any other subject for that matter. Where do we teach failure and how to recover from it?

What the pres say Several famous software designers have articulated some of these same ideas about design. In Programmers at Work,

ther sublowing luminaries commented on the design process as they we to resaw it: "The first step in program-

"The first step in programming is imagining, Just making it crystal clear in my mind what is going to happen. In this initial stage, I use pencil and paper. I just doodle... because the real picture is in my mind." — Charlas Simonyi, creater of Microsoft Corp. Multiplan.

 "At some point, the [design] gets explosive, and I have everything inside my brain at one time ... All sorts of things go on in my brain that I can't put on paper

use I'm always changing
a."—Gary Kildall, creator
igital Research, Inc. CP/M.
so have to simulate in your
allow the program's going to
t... When you're creating

that model in your mind, it's a lonely thing." — Bill Gates, chief executive of Microsoft. Another crucial finding about design that comes from research

Another crucial finding about design that comes from research—such as Willemien Visser's work in 1987 at the National Institute for Information and Automation Research in Le Chesnay, France—is that designers rarely start from scratch. That is,



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model from a prior solution to a similar problem as that first cut at the model that begins the sim-

dividuals doing design. ign in the 1980s has into more of a team pro-

for individual designers, and in-terdisciplinary problems have created a need for multiple and diverse shills among designers.

s have gotten too big . The teams create a shared

Today's teams of designers are typically composed of three

ign becomes an organization

al problem. Typical org izational design olves into a h

t some point, the [design] gets explosive .. All sorts of things go on in my brain that I can't put on paper be-cause I'm always changing them."

GARY KILDALL CP/M CREATOR

pointed out that the best prod-ucts, the ones that most people agree have conceptual integrity— like Pascal and Unix — were designed by individuals. And while there are successful team designs, like Aks and Cobol and the IBH mainframe operating systems, they are generally looked down on as being success-ful the chance. Provis mosts of



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ame or even organizations can design. They use many of the me techniques that individuals ploy but they also use group coses, a clumy but conceimes consary way to do business. Now that we have gained in-fit, we have to decide what to with that knowledge.

be solved. If the problem is big through which to deal with cog-enough or complex enough, then nitive software design: the impli-teams or even organizations can cations on the teaching of decations on the teaching of de-sign, the implications on the doing of design and the implica-tions on the managing of design. In teaching design, it will no longer be enough to teach one, two or three methodologies and

representations.

Those older topics must be taught within a framework that

includes the idea of design as a includes the siea of design as a mental process. In doing design, it will be help-ful for the designer to under-stand that the heart of design is not what be thought it was sup-

The true method The clamsy, iterative process of trial and error that the designer irsal and error that the designer is probably pursuing is actually searchers further suggest the

the way it is supposed to be. That understanding may give de-signers the confidence to pursue

in managing design, mani ers should focus on communi tions facilitation

agement of design should be management of design should be the management of the key is-sues that arise during the design process. In pursuit of these goals of better design education, prac-tice and management, several tool concepts have been pro-posed by the researchers.

We do not know how to build we do not know now to build all of these tools yet, but as they become widespread, they will go a long way toward assisting in the cognitive design process. These tool ideas include the fol-

lowing:

• Modeling and simulation pack ages designed to support the

> ou have to simulate in your mind how the program's going to work.... When you're creating, . . . it's a lonely thing.

> > BILL GATES MICROSOFT

ental process

 Idea archive and retrieval packages to prevent thoughts from falling through the cracks. Strategic assumption surfac-ers that keep track of key requirements and pop them up when a potential design is about to violate one

Unresolved issue recording

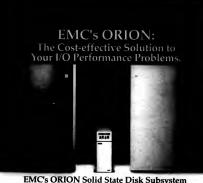
Group idea collection and coor

dination.

It may be premature, however, to talk about tools to support the cognitive process of design.

We are just beginning to understand what design is really about after thinking we knew what it was about for the last 30 years. Perhaps just that should be enough to absorb us for a while. Figuring out what to do with that knowledge may be an issue for a later time.





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for years to come.



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design at a price that's also attractive.
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The consequence is a machine that can be configured with up to four CPUs running concurrently. Yet one that can deliver processing power for as low as \$6500/MFLOP, one-tenth that of the competition.

Equally impressive is the fact that while our new Personal Supercomputer calls on a brand new technology, it doesn't forsake the old. It lets you work in a distributed UNIX\* environment, supporting Berkeley 4.3 and System V.3.

# n the only way to deliver uild a better architecture.

And it's totally compatible with other Apollo workstations. So you can retain all of your current applications, courtesy of a built-in compiler technology that ensures existing programs run more efficiently.

Arrange soon for a demonstration of the Series 10000. It will grant you a view of technology more inspiring than you've ever magined. Which is, after all, the reason to build a new workstation in the first place.

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Standard is the key word here. Standards let of the best terrinology offers. Without ever having to risk their investment of time or money.

For that reason, we have joined with other leading technology companies to support a standard based on UNIX System V.

A large number of users have already embraced System V and committed millions to it.

We feel an obligation to support those users. And believe the best way to support them is a unified UNIX standard. Make no mistake. In the long run, the level playin, field created by a single standard will be as good for Unisys as it is for customers. We plan to connecte aggressively.

But the first step to healthy competition is healthy cooperation—

# UNISYS The power of 2

# MANAGEMENT

TAKING
CHARGE

Linking up profits

profits and planning

"Horse" and "carriage," flow" and "marriage," profits" and "planning." Each word go to sether, even of the romatris, the wif are offended by any third of more and a nemter of the romatris.

mentions love.

The link between profits and good planning may be more crucial than ever in the information systems business, and the evidence came through in the comments of successful IS executives who spoke at the recent Institute for International Research conference in New York on "Profiting from Strategic Information Management."

formation Management."
It is true that various speakers slipped into technology mode, detailing how optical dista or new processors help their companies. Others moved into talent mode — boasting about the skills of their subordinates. But their remained a common recurring theme, and that related to the value of planning, particularly in tying IS plans to the corporation is plans.

The speakers included some of the best-known U.S. information directors, such as John Hammitt of United Technology Corp., Darwin John of Scott Paper Co. and Irwin Sikkin of Actna Life & Casualty Co.

The discussion repeatedly returned to topics such as the importance of a strategic information plan and the need to focus research and development on technologies that are critical to the success of the company. Adding another 20 million instructions per second (MIPS) of computing power or bindly bring 100 programmers just him in 100 pr

of computing power or blindly hiring 100 programmers just doesn't make it these days. IS executives must establish and nurture relationships with their clients, who include the end users in the corporation, the executives who run the company and the outside customers—

ny and the outside cus and, again, the speaker Continued or NOVEMBER 7, 1988

# The MIS message: How to get it across

BY ALAN J. RYAN

The job of spreading information within a company varies in direct proportion to the type of information to be disseminated, so uponed a rumor within minutes. But when the MIS department wants to get its message across to users, it is not that simule.

exit miss opportunities each of the information-dispension of the information dispension of the information of the information of the information of the most wide of the information of

using the systems.

• Electronic mail and bullet
reboards for quick messages aier
dely ing users to systems inform
yed
tion, events within the compuing community and relate

ing community and related matterials.

Thone support lines for users with questions or problems.

Non-MIS employees designated as departmental resident experts who can help to field individual or departmental computer problems or questions before users turn to the MIS office.

ers turn to the MIS office.

• In-house users groups, which users can veice conc and share insights.

• Systems manuals and

manuals.

All of the companies nurveyed said they rely on more than one method to dispense information, but all methods meet with vary-

off an incursor.

The most common problem MIS faces in trying to spread its word in that most user communities are composed of two separate groups: those who are sectually inclined and those who are not. Since most companies do not have separate methods do not have separate methods.

On the other hand, the relatively low competition for data processing jobs in Atlantic City gave rise for the energetic Swanseen to advance from being a computer operator at a local hospital 11 years ago to his current

offee deep struction arroved college dropout, former purkinglot attendant and self-taught personal-computer garu Matthew Meldon the opportunity to climb the ranks in cannos throughout

PROFILE

or dealing with both commings, the most effective ways alk to users are through publicons aimed at general as moss, via E-moil or through s

"It's a large audience to address with one solution. So, we let our users dictate which level of support they are going to tap into," said Joe Vincent, director of technology planning at Humann, Inc. in Louisville, Ky. If the newsletter is inadequate, the user is invited to call a special

At Metropolitan Life Insurance Co. headquarters in New York, the magazine Perspectives on Technology, a Journal for Se-

approximately three times a Continued on page 120

Technical analyses taking the cake. Page 118.
 How do you deal with your own turnswer? Page 122.
 More pathways within Monassie. Page 123.

# Trump Plaza pulls royal flush on information boardwalk

BY ALAN L RYAN

The name of the game in the cavernous, mirrored casino is staying abead by drawing the best cards. In the cramped computer room and generic MIS offices off the back corridors at Atlantic City's Trump Plans Casino and Botel, the same theories apply.

In the New Jersey city by the same theories apply.

olers' dollars flow like the tides, frump's 35-member MIS department has nearly \$3 million to spend annually on its hardware software and staffing seeds. It has young but experinced players deciding which suchnologies to bet on. MIS Director Karl J. Swan-

seen, 34, is responsible for fee ing Trump Plans abend of to competition by making the P as's customers happy and kee ing the company's computer to era content.

may be gamblers who have credit lines ranging from \$500 to \$1 million approved within minutes, or those who have trouble-free check-in and check-out — are more likely to spend their gas ing money where they get to best service. Swanseen's ma date is to keep customers hapby giving Trump Plans computusers the hardware and sort they need to get their jobs don That task is becoming mocomplex as the Plans's intertional database of rated gas blers, now numbering approxmately \$50,000 normately.

Growth in the name of the game, and it is happening in Atlantic City and in the casinos that line its shores. The once-opulent seaside renort noted for its examined into a shabby has-been by the 1970s. Now, the big casinos are revitationing the area that was the impairation for Parker Brothers' Monopoly game.

Those caseinos, which include

the Trump Castle and the under construction Taj Mahal, which may become another Trum holding, bring MIS jobs and op portunity with them. Sell, Atlan tic City does not yet have the al lure of big cities for MIS jobs and it is a problem Swanseen is constantly bettling.



Trump Plans Carine and Hotel.

Mission: To offer state of the art technology to in-house users so that they,

the city to become microcomputer manager at Trump Plaza at age 27.

For Swanseen, one way to retain employees such as Meldon is

For Swanseen, one way to retain employees such as Meldon is by giving the talented workers what they want: "Staying stateof-the-art is one way to draw the best talent and keep the talent

that you have."
Trump's equipment will soon include three IBM Application System/400 Model 60s that will Continued on page 125





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NER WHO CAN HELP O THE PLANT FLOOR.

## Study finds DP operations salaries up 6.6%

BY ALAN J. RYAN

ORANGE, Calif. - Data entry centers - and those who run them - are becoming things of the past at many corporations, while new, more lucrative positions are opening up for technical analysts.

Those are the findings of the

1988/1989 survey of data processing op-erations salaries of the International Ason for Computer Operations Man-nt (AFCOM). AFCOM also determined that within the 400 large and medium-size companies polled, overall salary increases in DP operations aver-

projected by last year's respondents to the survey and include the DP ope puter operations, data control and data entry areas.

There is less manual work being done in the computer room now," said Leonard Eckhaus, president of AFCOM. "With automation, we expect to see a lot less of the traditional operations staff" and more

technically oriented analyst positions in erations is the DP operations manager, who earns an average of \$48,900 annual

Eckhaus said larger shops tend to pay more than smaller operations, and the highest salaries for most of the positions surveyed are typically found in the North-cast, followed by the West, the Midwest

For the opera stance, the average pay figure swells to as high as \$54,800 in the Northeast and ips as low as an average of \$43,400 in

The DP operations manager, accord ng to the survey terminology, is respo le for all activities in the computer operation, data control and data entry

sections. Operations managers prepare the annual budget, set policy and review the performance of all section supervisors or managers, set goals, do future plann erational areas.

Following the manager on the pay scale are DP operations analysts, whose average annual pay is just over \$33,400, cording to the survey.

AFCOM describes the position as the

highest level general-operations techn position, with the analyst's job including oting in all operations are developing and preparing statistical re-ports on systems and throughput and pering physical planning for the con

In regional pay averages, the same op-erations analyst would earn \$34,300 in the West, \$31,800 in the Midwest; \$34,500 in the Northeast; and \$29,500 in the South, according to the survey re

Maintenance programmers, or those who work with existing production systems and develop code to correct or modi-fy existing production systems, closely scale with an average annual income of shightly more than \$33,000, according to the AFCOM report. The maintenance programmer position saw the largest salary gain by position, climbing an average of 11.8% over last year's survey. Eckhaus

Doing well in telcom The telecommunications analyst, who performs troubleshooting on all network problems, will earn an average of approxi

and data entry and monitors throughput, typically earns the lowest pay in the DP operations area, with an average salary of ust more than \$27,000, according to the

The largest salary gains by depart-ent were typically in data entry, which mped 8% over last year's results, Eck-

Positions in that department range from the data entry operator, earning an average of \$16,700 on the low end of the pay scale, to data entry manager on the high end, earning \$28,800. However, he oed, many companies are ei

custioned, many companies are eliminating their data entry departments.

"This year, only 44% of those surveyed reported having a data entry department at all. Biased on what we're seeing, the formal data entry department as such is something that is going to totally disappear rapidly." Eichnus said. In 1984, the AFCOM survey found that 95% of those surveyed had formal data entry departments. In the com

in the component of trained earns an appearator trained earns an appearations in \$16,500, and an operations in found in (

According to the report, the most diff a nonitions to fill are, in this order, con er operator, operat

Of those responding to the sur % had budgets of less than \$2 mi sost 41% had budgets you the n to \$3 million; and n ets of \$3 million to \*



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COMPUIERMOKE

# Job networking the right way

turnover can be a challenge for any man-ager who has to find new bodies to fill va-cancies. But an outplacement firm located

cances, but an outpacement term societies bere offers managers advice on how to deal with turnover when it is the managers themselves who are turned over.

James H. Lane, president of the outplacement division at the Costello, Erdlen & Co. human resources management constituting firm, points to networking as a vehicle in which 80% of all new vides are found.

"Fall is a smart time to launch a ing campaign because it's the be-of many business and social calen-

dars." Lane said. But Lane also cites pitfalls in how people approach networking in the job market — which some might the original peer-to-peer networking.

He listed dos and don'ts to follow

 Develop a plan. Networking is a market-ing process that should include defining an objective, targeting prospects, making contacts and following up each meeting. Be patient yet persistent. Lane's tacti-cal tips include befriending secretaries, cing telephone calls to beny executives ing early morning or evening hours

and opening a call or correspondence with the name of a mutual acquaintance. • Don't always count on others to do follow-up work, such as passing along a rene, and strive for pe

same, and strive for personal contact with the potential employer.

Be open-minded. Network contacts must extend beyond decision makers. Po-tential sources for contact with new em-ployers might include clergymen, mai-men, gas station attendants and school

Don'ts

Don't ever ask for a job. A networking meeting is a require for contacts, leads or professional advice. However, approach such a meeting as if it were a job interview by dressing appropriately, discreetly

bringing a resume and rese

 Don't refer to competitors. The executive with whom you are networking does not want to hear that you already met Don't surprise anyone. A professional approach is to write a brief introductory letter using the second professional approach is to write a brief introductory.

approach is to write a brief introductory letter using the name of a contact or referral, make a follow-up phone call and write a thank-you note later. 

• Don't turn down invitations. Vahashle contacts can be made at cocktail parties, political fund-raisers, parent-teacher functions and alumni activities.

 Don't forget to reciprocate. When you are comfortable in a new job, remember to be generous with your time and or when a networker calls you.

disaster backup

Maybe comebody has been listening to all the warnings about the need for disaster backupa and covery prisms.

The revidence in offered transpired and the state of the state o

Of the sites with emergency pla systems in place, 12.6% use a commercial service, with sites running large hosts such as IBM 3080 and 3090-class ma-chines most likely to use such a commer-

in a separate report, Focus noted that

MANAGEMENT BRIEFS

Focus finds

catching on

Yesterday, somebody asked me what I think about LattisNet. Here's what I told him in a nutshell

If you're running Ethernet with out LattisNet, you're doing it the hard way. LattusNet means not having to

LattinNet means not having to review your primises with causaid cable SynOptics created the idea and prefetched the Lecthology two years ago. SynOptics was the first to put Ethernation sitesplose with, the EMD Cabling Systemand fiber coptic cable. And two, first to put the UTP trans-criver on a chip for network skapter cache. Roday over laid of the Fortuse 500 laws LattisNet, Here's very LattisNet is the evortwing skilly that enables you to run Ethernet in a start topology over your existing.

that enables you to run Ethernet in a star topology over your existing building wring. No matter who your computer versions are. Or how many buildings you have. Full-speed, no compromise, IEEE 802.3-standard Ethernet.

Are You Running Ethernet, or Is It Running You?

Just imagine what you could save in time and money by installing Dhernet without having to run co-exial cable throughout your building. Then consider this, Lams Net is

d fault isolation and diagnostic capability. With Lattis Net, it's dandard equipment. With tradit

And, unlike traditional Ethernet,

LattisNet is extremely simple to con-figure, reconfigure and expand. It was designed that way, based on modular concentration that reside in your writing closests using the most common cabling connectors. It means that moves and changes can be com-pleted in pricesses

pleted in minutes while the network stays up. That keeps

a need to expand the sare of a network, you approach the system simply by adding

All In The Family. SymOptics Communications sizes to economically accommodate network growth, from very small to very large. The new Workgroup Concen-trator accommodates as few as two eight users—either in stand alone

workgroups or as sub-networks within big networks. For even larger applica-For even larger applications, each Department Concentrator handles up to 24 users. And each Premises Concentrator handles up to 64 users, with no end to the number. And LattisNet bas all

approvals.
The idea is big and simple at the same time. That's why more than 250 of the Fortune 500 companies are custing Lattichet now.
There are more than 75,000 Ethernet. notes in over 500 LattisNet local area networks across the United States and Europe. It works. And there's no

SynOptics . 329 North Bernardo Avenue Mountain View, California 9 (800) USA-8023 Appropriate Age (married to the control of the cont

ell and Western Digital Can't All Be Wrong.

That's right. The leading board manufacturers have put Lattin Net transcriver chips on their cards for Macintosh, IBM, COMPAQ and other compatible PCs, workstations and compatible PCs, workstations and file servers. And of course, it's not only simpler and more convenient Stripsy par, users a structure to true Ethernet.
Call (800) USA-8023 for the Lattis/Net connectivity guide or to talk to a technical representative.

in a separate report, Focus noted that more sites than ever are using uninter-ruptible power supplies (UPS). Focus said that more than 25% of the large-scale computer sites surveyed have a UPS and that 6.2% plan to purchase one. Two years ago, only 17.6% of the sites ran a UPS.

The Data Processing Management Association (DPMA) recently joined the affiliate associate program of the Corpo-ration for Open Systems International (COS), the organ

operability.

"DPMA has a history of joint involve-ment with others to further common goals. By joining COS, we continue this practice and join the major effort to bring open systems architecture to our market-place," said DPMA President Christian G. Meyer.

Four Andersen Consulting users groups have consolidated their work have consolidated their work have as A Shared Solution in Software Technology (ASSIST). The organization lauving to form ASSIST are MAC-PAC, Method/1, DCS and Systems 3A, ASSIST has scheduled its first conference for May 17-19, 1989, in Chicago.

Elliot C. McEntee has been named president and chief executive officer of the National Automated Clearing House Association (NACHA), which is



## Monsanto's MIS stars rise two ways

BY ALAN J. RYAN

ST. LOUIS - A year ago, the only way for Monsanto Co. to recognize its MIS tal ent through promotions was to move those stars away from their areas of hands-on technical expertise and into

anagement or supervisory posts.

Today, that has changed. The informa-on systems leaders realized that every technical person might not necessarily consider management as his goal and that not all technical people will make effective

So, the single career path was widened

trade association representing 42 U.S. learinghouse associations. McEntee, who will join NACHA in mid-

November, is currently associate director of the Division of Federal Reserve Bank Operations for the Federal Re

NACHA also ar duction of an ACH Participant Directory, which will contain current information on the Federal Reserve's Composite Receive File and membership status codes. Other information relates to the type of institution, a contact name and an associa-

The National Office Machine Deal-ers Association (NOMDA) is consoli-dating its four-event regional show format into a two-show format with plans for an East Coast show in Orlando, Fla., scheduled for March 1-3, 1990, and a

West Coast show scheduled for Nov. 2-4, 1989, in Long Beach, Calif.

MIS managers used to complain that too many conferences were too broadly tar-geted. That doesn't appear to be the case with Imagineering '89, which is schod-uled for May 14-16 in Milwanice. It is a national conference of motor vehicle de-partment officials who are interested in electronically automated administration. Information is available from John F. Wisconsin Department of Trans-on, Division of Motor Vehicles. portation, Division of Motor Vehicles, P.O. Box 7911, Madison, Wisc. 53707.

Another focused conference is solicit-ng papers. It is the International Syming papers. It is the International Sym-posium on Computerization of Mate-rial Property Data, and it will be held Nov. 30-Dec. 1, 1989 in Orlando, Fla. Ab-stracts can be sent to Dorothy Savini, American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa.

in the "But will the MIS managers buy it," category is a new service being of-fered in the Chicago area. Data Center Services, Inc. (DCSI) of River Grove, Ill., is a company that claims to recognize the need for cleanliness in data centers. Run by Phil Marino and Peter Cikesh, who have a 15 years of experience in data center installation and maintenance be-tween them, the company provides sub-floor vacuuming and tile cleaning. The firm said it lifts the raised floor

tiles and vacuums the subfloor to reduce the possibility of downtime and fire hazards. The tile-cleaning process reportedly reduces static. Some customers include IBM, McDonsid's Corp., AT&T, Kraft, Inc. and Sara Lee Corp., Citesh said. to a dual career path that now includes a technical advancement ladder. It is an unusual individual who pos-

sesses both technical and managerial skills, said Leonard Cohn, Monsanto's vice-president of information systems. But the peer pressure and organizational pressures within Mossanto, like so many companies, left people feeling compelled to strive for the management jobs. If the individual found that management was not his calling, "It became difficult to became difficult to

nound that management was not his calling, "It became difficult to backtrack — to swallow your pride" and accept a lower-level ph, Cohn said. The idea for the seches and The idea for the technical advance-ent program was not an original one

within Monsanto's MIS confines, Cohn said. The program was modeled after Monsanto's dual-career path option for its acientists, the Science Fellow Program, hich allows the company's skilled scien-sts to climb the ladder through either

tists to dime use money acceptance of the MIS career path, Mossanto created three new position levels: systems technologist, sendor systems technologist, and distinguished systems technologist. Personal or and financial control of the money acceptance of the money accep ities are equ le in mana

mpany said. Within the MIS department, "Promo tions are based on creativity, initials motivation and exceptional achievem in areas of expertise valuable to M

areas such as programming, sy alysis, operation system plications development as Early last month, two in

ometed to jobs hotens, if titles, be said.

The real thrust was to find a way to rovide recognition and, hence, motivation to those who have demonstrated that hay are superb specialists in the use of echnology and give them a way to consider the constraints of the constraints.

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# MIS message CONTINUED FROM PAGE 115

azine is intended as a way r. The magazine is intended as a way nforming managers in various depart-nts throughout Metropolitan a domes-office and affiliated companies about erging technologies and other issues ting to MIS, Editor Paul Steinfeld ex-

einfeld said the publication address-merging technologies, reasons for idering them and where to get more ial users, there are technical newslet to keep them informed of MIS issues

At Touche, Ross & Co. in New York, an innovative program was begun more than six years ago to keep users in the w. The company has a seven-member microcomputer support center staff to give the users a place to turn with ques-tions or problems; it publishes four or five bulletins monthly on various topics.

Meguzine poli
The support center staff annually polis
each user on which of the seven types of
technical builetins published by the group
he would like to receive. Topics include a
general-interest builetin and others
geared specifically to software, hardware,
promunications. erating systems and communications, cording to Ronald Jenks, partner and di-

according to Roman Jenus, partner and or-rector of information services at the firm. Jenks said the support center's charter is to conduct research and comparative evaluations of new products that might be evaluations of new products that might be of interest to the user community. In ac-cordance with that, the group tests print-ers, software, portable and transportable personal computers, presentation equip-ment, slide-making equipment and other

#### Connolly

CONTINUED FROM PAGE 115

e note. IS must learn about the be

same note. Si must learn about the business side and the paness that and the mess side and the paness that note and the business, which requires taking the affirmative stop of drawing out of seal users their specific noted and gools. The speakers discussed project manifest the speakers of the speakers

No one seems to advocate that IS de-velop a plan and stick with it. Such an ap-proach would be foolish in today's busi-ness environment. But the continued ferences to planning are further proof how the IS executive's job is changing. The days are gone when IS planning

The days are gone when IS planning committed of tracking how many MIPS, terminals and programmers were needed or affordable. Today's plans have to consider what the competition is doing, what type of hardware and software platforms will be needed, when the system is delivered and — of greatest importance — whether the benefit to the company through increased sales or reduced costs justifies the IS strategy.

Connolly is Computerworld's senior editor, man

products from various vendors.

After each evaluation, a bulletin is put together discussing the category of prod-uct evaluated, the brand names looked at and the merits or drawbacks of each. The bulletin desc es one and also tells "I no busierum describes one and also teits why the others don't stack up to the one we selected," Jenis said. If none is appro-priate, the bulletin notes that as well, he

Newsletters are also popular at North American Philips Corp. (NAPC) in New York, where the user population receives a newsletter entitled "Technology Top-

ics," and through the mainframe-based IBM Professional Office System (Profs) E-mail system, which has a potential audi-ence of 8,000 users within the company. The newsletters are exceptional in

that NAPC publishes them using a different desktop publishing package each time. "While you recognism it as the technology nerwisetter, it is different each time, and we tell people which package we used to do it," and Thomas O'Leny, Jr., director of Mills Centhology. Tr., director of Mills Centhology. Tr., director of Mills Centhology. The Centre of Mills Centhology and that NAPC balactus board, which includes the Centre of the Cen

O'Leary said.

"When you log onto the E-mail system,
a banner comes up and tells you if something has changed in that section of
Profs," be explained. Other methods of
disseminating information include periodic workshops and informally, by word of

The educational seminars and classes aimed at briefing users on emerging tech-nologies and more efficient methods of utilizing information technology are also the open seminary and the companion tly used at the other

illed by Computerworld.

Metropolitan's Steinfeld said his cos my holds a three-part executive semin puny holds a three-part executive seminar series annually in conjunction with Per-apertuse on Tachnology. Those seminos are videotaped and kept in the corporate library so they can be used as a resource for people not in attendance. "It would be nice if we had a more rig-

orous approach to keeping the users in-formed," Humana's Vincent said. "But this is a type of network that is built up over time, so we aren't about to dismantle

nc network pass this simple test?

## Trump Plaza

replace three IBM Sys-tem/38s that are quickly reaching their limit. Each Sys-tem/38 is dedicated to one of the Trump Plaza's main functions: a hotel system, a finance system and a casino system that is used to track and rate the gambling cus-

The MIS strategy downplays technological gambles in favor of cautious spend-ing on proven technologies, Meldon says. The local competition is tough because of the resonance are working on similar inost of the casinos are working on similar systems, so gaining the edge by using computers more effectively than the oth-ers is important, he adds. which allows gamblers at approxis 50% of the casino's slot machines to credit toward meals and rooms. It

says.

The technology involved for that is an old Digital Equipment Corp. PDP-11 is dinto slot machines that have magnetic card readers built onto them. When the player wants to track his spending, be can insert the Trump Card into the machine. The information passes through the PDP-11 to the System/38.

For in-house security, the Plaza has a Hewlett-Packard Co. HP 9000 mid-range nputer. Plaza employees are issued ds that act as time cards for hourlyre incuss, and anow concroned access to incus parts of the building. The employ-holds the card in front of a beam of light tith allows or denies access to an area. granted, the access is automatically re-reded with the employee's identification er on a prin

The HP 9000 is also used to handle the implex schedules of dealers for the case is floor. Dealers work nine-hour shifts ternating one-hour on-duty stints with

ternating one-hour on-duty stints with -minute breaks.

The HP-based scheduling system, ritten by an outside vendor for the rump Pizza, sutomattes tasks that casino ministrator Roger Martel did by hand in

other casho jobs. He tried to write the program on a personal computer at his home, which had dispositing results because the task was too complete for a PC.

Neutry all of the PC. in the host as well to the program of the program of the program of the standard st

adds. Another Trump Plaza challenge is to keep people coming back. "Direct mar-keting seems to be the most effective way to reach people today, and it is a big issue for us," Swanseen says. "We have a half-million people on our international data-base, so we try to establish a rapport with

them."

Direct mailing for Trump events are coordinated according to the types of players they are most likely to attract. The system tracks such players by colors that correspond to the value of the chips that they typically shuffle across the fetcovered gasing tables.

# Simple Test

1. Does your network provide for both wide area and local users?

Does your network support point-to-point, multi-point and Ethernet\*

configurations?

3. Is your network able to talk synchronous when necessary?

4. Can you easily add

users, nodes and new applications?

5. Can your network recover from a disaster on its own?

6. Does your network management maximize performance and control?

No

s\_ No\_

es\_ No\_

\_ No\_

No\_

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NETWORK

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to pass the toughest test of all: reality Best of all, our ENA Network Manager gives you the power, visibility and control to fine-tune your network and to handle

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## Bettor way

#### "Computerworld Response Card Decks really opened doors to the 'heavy-hitter' accounts..."

Spectrum Concepts, Inc. is a 10-year-old software developer based in New York Ciry. The company, which provides software and services to large corporations and financial based software product that dramstically improves file transfer between different computing environments. XCOM 6.2 eliminates the need for extensive custom programming when transferring data from one computer seattlength of the product of th

Company president Alec Gindis was impressed with industry reaction after a news story announcing XCOM 6.2 appeared in Computerworld. So when Spectrum began implementing its marketing strategy for the new product, he considered Computerworld a key recovered.

complere connectivity projects.

"Our goal was to generate sales leads from major organizations — Fortune SOD and Fortune 1000-type companies — that need to transfer files. We decided to use response card decks, and, based on the reaction we got to that product announcement, Computerworld's was the card deck we thought of first.



- Alec Gind

"And it's paid off, the results have been terrific. We've received hundreds of high-quality leads so far, and they're still coming in. In fact, Computerworld Response Card Decks really opened doors to the 'heavy-hitter' accounts — major organizations that learned about us through the cards.

"Now we've gotten to where we are recruiting additional account executives to follow up on the volume of these leads. Computerworld Response Card Decks give us the best cost per lead of any medium. They also let us refine our marketing strategies through scientific 'split testing' — something other card decks don't always ofter. We consider that a valuable homus."

Computerworld Response Card Decks give you a coneffective way to reach a powerful buying audience of over 127,000 computer professionals. They're working for Spectrum Concepts, Inc. — and they can work for you. Call Norma Tamburrino, Account Manager, Computerworld Response Card Decks, at (201) 967-1350 to reserve your space coday.

# COMPUTERWORLD RESPONSE CARD DECKS

Computerworld is an IDG Communications Newspaper

# **COMPUTER INDUSTRY**

#### INDUSTRY INSIGHT

Clinton Wilder

#### Look into my crystal ball



the strategic planning types at IBM's competitors put bread on their tables by thinking about on their tables by thinking also these things. A Boston consult ing firm called Northeast Con-sulting Resources has spent a good bit of time in the last seve al months thinking about it in producing a report for the top

At the recent Seybold Exec-utive Forum in Cambridge, Mass., Northeast Consulting cased its copyrighted "Fu-

sent David Mason mapped

President David Mason mapped out five possible scenarios ranging from the predictable to the revolutionary. They are listed below, with this observer's opinion as to their likelihood, enario 1: Con

m, in which the IBM of 1992 will closely resemble the IBM of today: controlling the rame and storage martets, slowly diversifying into Continued on page 134

# Miller spins straw into gold

Enterprising former DG exec finds a niche in market for RISC technology

BY J. A. SAVAGE SUNNYVALE, Calif. - In the

year since Bob Miller took over as president of Mips Computer Systems, Inc., the company has grown so much, he is already looking for a new building. To

"In Silicon Valley, you know a company is really successful when they have three fountains," Miller said in a recent interview. "In the new building, "- arises for four. That's the

I'm going for four. That's the

ego, ne mon.

Mips, a privately held, reduced instruction set computing
(RISC)-based company, splashed
into the big time last month in September when Digital Equip-ment Corp. agreed to distribute its technology in return for 5%

an option for another 15%. DEC also has the right — but has not continue to use their RT basic 801 architecture. They've made a lot of investments in it," he acted upon it — to add another member to Mips' six-member

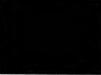
Formerly second in command at Data General Corp., Miller said he offered the Mips archi-tecture to DG before going to ri-val DEC, but it did not take the

Miller said he does not care

Miller said he does not care whether his systems carry the logo of Mips, DEC or any other company, as long an Mips 'tend of RISG strahtscture is in the marketylace. Apple Compater, loc. has let it be known that it is to the control of the control

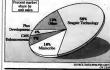
er distribution channel the size of DEC's. While reluctant to sell off any more pieces of the company, Miller said that for the one or

two companies out there with the market impact of DEC, he would entertain the idea. Maps has been able to grow as fast as it has — from deep in the red only a year ago — by cutting its commitment to chip manufac-Continued on page 131



pa' Miller has four-fountain ambitions

#### Lion's share for Seagate er U.S. retail unit shares for hard dish drive vendon



helm of Cullinet

Weiler at

BY NELL MARGOLIS

WESTWOOD, Mass. — In April, Cullinet Software, Inc. President George W. Tamke — President George W. Danne — in the wake of a sweeping execu-tive shaffle that left him the sole survivor of the old guard — sin-gled out Executive Vice-Presi-dent Robert K. Weiler for praise, ing that Weiler's role "will do hing but expand in terms of consibility and importance" he new administration.

## IBM Korea keeps a low-cost profile brought a new flow of interior tional influence into the cou try's relatively homogenia market. And that appreciationakes export prices higher. South Korean market, he must

BY LORI VALIGRA

SEOUL, South Kores - As a general rule, IBM is not the low-est priced vendor in a given bid n. But when you are IBM rea, keeping costs low is the

Korea, keeping costs low is the key to your very existence.

"People want high function and low cost," said Son Yong-Ho, director of technical support at the IBM subsidiary here. "That" as big challenge here, because the economy cannot sup-port expensive units. My re-sponsibility is to make low-cost

and prices down in the domestic

no keep a lid on expenses for pplying displays and other imputer components to other IBM Korea is a net exporter within IBM's International Pro-curement Office (IPO) operation, which matches demand with manufacturing ability at IBM plants around the globe.

Won up on the dollar Exports are becoming a problem for IBM Korea because of ex-change rates. South Korea's cur-

rency, the won, appreciated some 12% against the U.S. doltar in the past year, partly be-cause the recent Olympic Games

makes export prices higher.
"If we compete in the U.S. market, the supplier and export costs here must be lower than U.S. production costs. Otherwise, we will not have a business here," Son said. He also said that putting in more locally procured components belop keep costs in line and minimizes effects of currency flactuation.

cal procurement before it began selling its Model 5550 Korean Personal Computer in 1986 is that the South Korean govern-COMPUTERWORLD

ent had a requirement that oducts sold in the country we 50% or more local content.

Apru.
"We still try to use more local
components because of costs,"
Son said, noting that doing so
eliminates the duties that would

Compatitive bids
To get components for the
5850, IBM Kores heid competitive open bidding, as it has no
manufacturing of its own in
South Korea. Hyundai Electronics makes the control unit, and
the Goldster Group makes 5550 ipherals such as printers,

# Europe, Japan, U.S. patent groups meet to unify systems

property rights and formulates policies.

ents based on a first-to-file system. Additionally, the three geographic areas are working on a computerized system to ex-change patent information, parts of which

TOKYO — Members of patent offices in Europe, Japan and the U.S. began prefini-nary meetings here last month, which were aimed at harmoniang the patent system; in their respective countries.

The three geographic areas represent 50% of the patent applications globally, said Hajme Aburaki, a director at the Jap-manese Patent Office, at a press confer-sates.

Aburaki said the resolutions of the To-kyo meetings should help the World Intel-

are already up and running.

Some of the other aspects mailed in Tokyo include the period for which a patent is granted, patentability, interpretation of patent claims and how to handle appropriate to including of a patent

Japan has been criticized by other sa-ns for how it interprets the scope of tent claims, the U.S. for the period of

Potent debate
One area of lingering debate is the U.S.
policy of granting patents based on innovation vs. Japan's practice of granting patents

This marks the sixth trilateral me take place for the purpose of we putent processes and defini

IN BRIEF

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#### What's done is

clone
Stating that he has accomplished what he set out to do — make the company's business productivity activate in competitive and expend international sales — Micropo International Corp. Chef Executive Officer Leon Williams stepped down last week. Reglacing Williams in the front office is former Vice-Prosident week (Online Ones and Online Ones and Online Ones and Online Ones and Ones a President and Chief Operating Offi-cer Gari M. Grimm.

A quest for reporting simplicity and closer ties with sales and distribu-tion channels led Hewlett-Packard sectors. Computer Products, which concentrates on nigle-user trappiced products such as personal computers and workstations, will be hended by Executive Vice-President Lewis Patts. Networked Systems and the tic-wardship of Executive Vice-President Designs Canaco. Four of the groups formerly making up the Systems Rechnology Sector. Peripherals, Information Networks, Networked Systems and works, Networked Systems and making the Systems and the Systems and the Networks Networked Systems and the Networks Networked Systems and the Networks Ne

DB2 on the horizon sippany, N.J.-based software elopsaest and management con-ing firm Computer Horisons p. leaped onto the rolling IBM 2 bandwagon when it acquired tford, Conn.-based data pro-sing consultant Comptech, Inc., matech is a company that sup-matech is a company that sup-

#### Go West, young

lichard

into, Va.-based VM Software,
it, is requising soother benefit from

o October marger with The Sys-ense Center, its riving, Tenan

— this time, a president of the Sys-ense Center into 1984, will be-nice president and COO of VM others of the Sys-ense president and COO of VM others and Sysen and COO of VM others are of Sysen and COO of Con-tract President and COO Richard. Ramoust to follow through on his sense of the Sysen and COO of the Court.

#### The Apollo also

continuing OEM relationsh wen Apollo Computer, Inc. as tor Graphics Corp. last we ad Apollo its largest contra more than \$100 million of workstations

#### Weiler FROM PAGE 127

past spring's executive reorganization. At that time, John J. Cullinane returned for retirement to retake the reins of the com-pany he founded, ousted his hand-picked successor, David L. Chapman, and trig-gered the resignation of a number of exec-utives seem schapman loyalists. "The whole Chapman is toom, including

George, was brought in for a purpose, and they served it well," said Robert Ander-son, an analyst at Sutro & Co. in San Fran-cisco. The Chapman administration's mission, he said, was to implement a large-scale technological turnsround at a company seen as foundering on outdated

technology, while simulta-neously imposing solid cor-porate structure on a disormined entity that had atgrown its entreoreneurial size and state.
"Chapman and Tamke
brought that kind of structure from their years at
BBM." Anderson said. Chapman also brought in Weiler
and John B. Landry III, now
Cullinet's executive vice-

Cullinet's executive vice-prosident of development. Landry served to Weile's much based on market to the financial software graint. McCormack & Dodge Corp., where their efforts were seen as instrumental to the compani

rise, and then again at Dis-tribution Management Sys-tems, Inc., a software development company bought by Collinet in 1987. "Weiler and Landry are the future of Cullinet," Anderson said. "They've been pioneers

"They've been pioneers and innovators everywhere they've been," said Charlotte Walker, an analyst at County Securities Corp. U.S.A. "They've driven the new strategy at Culinet."



#### TI's OmniLaser 2115. The network printer you need when your application needs are demanding.

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#### DIMES NICKLES

and Tech

Chips and Technologies, Inc. announced revenue for the first quarter ended Sept. 30 of \$44 million, compared with \$29.6 million last year. Profits were \$5.7 million, or 39 cents

per share, compared with \$4.7 million, or 33 cents per share,

Britton Lee, Inc. reported a Britton Lee, Inc. reported a net loss for the third quarter ended Sept. 30 of \$786,000 on revenue of \$6.6 million, com-pared with a net loss of \$328,000 on revenue of \$7.7 million for the third quarter of last year. The net loss per share was 9 cents, compared with a net loss of 4 cents per share in the comparable period last year.

Policy Management Sys-tems Corp. announced revenue for the third quarter ended Sept. 30 of \$55.4 million, compared with \$46.2 million last year. Profits were \$5.3 million, or 33 cents per share, compared with \$4.4 million, or 27 cents per share, in the like period last year.

Computer Consoles, Inc. an-nounced revenue for the third quarter ended Sept. 30 of \$44.9 million, compared with \$37.8 million last year. Profits were \$3.4 million, or 24 cents per share, compared with \$612,000, or 5 cents per share, last year.

American Management Sys-tems, Inc. reported revenue for the third quarter ended Sept. 30 of \$53.7 million, compared with \$44.7 million last year. Profits were \$625,000, or 6 cents per share, compared with \$1.9 million, or 18 cents per share reported last year.

Concurrent Computer Corp. reported a net loss for the first quarter ended Sept. 30 of \$370,000, or 2 cents per share, \$370,000, or 2 cents per share, compared with net income of \$1.3 million, or 8 cents per share, in the comparable period last year. Revenue for the quar-ter was \$18.7 million, compared with \$20.3 million reported in

Network Equipment Tech-nologies, Inc. announced reve-nue for the second quarter ended Oct. 2 of \$32.2 million, compared with \$20.5 million a year ago. Profits were \$3.7 million, or 27 cents per share, compared with \$4.3 million, or 31 cents per share, a year ago.

EMC Corp. announced reven for the third quarter ended Oct. 1 of \$28.9 million, compared with \$34.2 million last year. Profits were \$276,000, or 1 cent per share, compared with \$7.9 million, or 34 cents per share, in the previous year.

come for the second quarter end-ed Sept. 30 of \$123,000, or 1 cent per share, compared with \$968,000, or 8 cents per share, in the comparable period a year ago. Revenue for the quarter in-creased 44% to \$18.4 million, compared with \$12.7 million reported in last year's like quarter.

Entertainers Cesar Romero, Pat Boone and Jac-lyn Smith were among those present last week when President Reagan signed legislation that will enhance international copyrig of U.S. software and other intelle ty, including motion pictures, rec books. The bill makes the U.S. a m Berne Convention, a 102-year-old treaty among 76 nations pledging adherence to mini-



The next generation of desktop computing will take us from being gatherers of data to being cultivators of information.

#### Miller

was sold on the

<u>M</u>etaphor.

generation.

The next

SILICON Valley, you know a accessful when they have three fountains."

BOR MILLER MIPS

g a niche in the Mips is branch amputer based on emitte pled logic (BCL) chips as w a standard CMOS-based pr or. Miller said it will off ormance of about 60 millio

instructions per second.

BCL technology was an int gral part of the DEC licens Miller said. The new system will be much faster but are e-mental to correct part are epected to carry an incre price tay for the higher as

"ECL is the Ferrari, formance muchine. T nds is the CMOS. You no the Ferrari about the percentag of time you'll need the ECL sy

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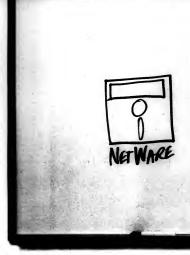
sophisticated, amazingly easy-to-use computer system. It's a means of turning corporate information into a competitive advantage. It gives companies an edge in the battle for growth, through gains in professional productivity and decision-making.

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Metaphor's system makes a big difference for Information Systems professionals, too. Metaphor lets users build their own applications, so IS managers can turn their skills to more effectively managing the corporate information resource, rather than grinding out user reports and applications from a seemingly endless backlog of requests. And given Metaphor's proven understanding of end-user needs. IS gains a strong support arm," too. That's what customers at over 100 installations in the

world's largest and most successful comwords sarges and most successful conpanies tell at. They proved Metaphr is
a powerful business tod, giving them as
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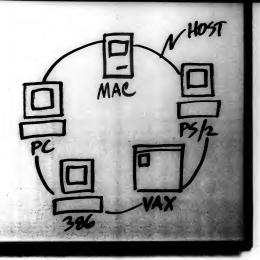
While this variety of solutions makes it easy for users to meet their needs, it presents some problems. Like sharing information between incompatible systems. The kinds of problems facing more and more companies as their information systems grow and diversity.

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you can solve those problems by making one simple choice: Novell. Novell's NetWares operating system software supports a myriad of computing environments.

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#### Wilder

CONTINUED FROM PAGE 127

gration but still mining its revenue an mings growth targets. Opinion: Nah. John Alters wants to we behind a much better legacy than it, and he'll he willing to take bagger as. He's already presided over the mon suive redephyment and one of the art similaries.

that IBM seentrube." In this scenario, the standards war will continue to rage and users will cling to the safe haven of IBM's proprietary architecture. The mainfrance will rule supreme, and IBM will cash in on its manmoth R&D spending with realizable breathroughs in

ing with realizable breaththroughs in voice recognition and expert systems. Opinion: Even less likely. The days of all-Blue account control are over, and we'll never go back. Once the "You'll never get first foor choosing BBM" stranglehold was broken, an entire spectrum of competitions rushed through the door. Can IBM succeed in this world! Of

can now succeed in this work: Of course. But never again with the domi-nance it once had. Scenario 3: IBM falters. It's the Blue nightmare, complete with the spec-

ters of IBM's first layoff in 1989, a suc-cessful Unix-based missicomputer from Hyunda in 1990, a market-demanded, non-SAA compatible IBM workstation 1991 and a keyboardiess micro from Apple in 1992.

Scenario 4: IBM eme vice provider — EDI, tran

Scenario 5: IBM breaks into four spanies. These would be 370 syste i storage; Personal Computers, mac ge boxes and servers; communica-

etwork services.

Opinion: Favored by Judge Greene
al the U.S. Justice Department — in a
semocratic administration. It sounds
streeme but is really only a leap of faith
way from what IBM is trying to do to-

sy from what 1894 is trying to do to—
push more and more responsibility
we to the line managers, under Terry
we to the line managers, under Terry
tenbach's direction, to better comtenbach is direction, to the terror
te with more mimble tivals.
Under this necessario, 1894's R&D ortimation would be shared among the
r companies the way Bellcore is
need by the seven regional Bell holding

What this ignores, however, is the IBM strategy embodied by SAA to bring recrything together via the software. If the SAA effort fails, perhaps IBM would be SAA effort fails, perhaps IBM would be software. consider something as extreme — the strategy is that critical. In fact, asonitor ing the progress of SAA is probably the best crystal ball to see what IBM will loo like in 1992.

#### IBM Korea CONTINUED FROM PAGE 127

"The hardware is becoming ver-isticated here," Son said, expli-it some local producers have smood 32-bit PCs. But Korea still

ton to a instituted a copyrage... only so of July. on the so of July. only so of July. on the Author-Tute Corp.'s Dense III, rosoft Corp.'s Multiplan and Lotts departed Corp.'s 1-2-3 have been verted. To meet local and export departed from the strategy is simple: "[4 to narvive in product quality, fine-in, cost and price. We must least full." on the contract of th

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## INTEGRAL SYSTEMS



# COMPUTER CAREERS

# In search of net management

Though hard to find, these posts offer challenge, mobility, earning power

BY JANET MASON

The job of net-work manager has been called one of one of the toughest to be found in MIS.

found in MIS.
But those working in the field
concur that the challenge of specializing in mainframe- and Digital Equipment Corp. VAX-based
corporate backbone networks
rnhances job satisfaction as well
to account the second of the second

The job of communications manager — before the wide-scale integration of voice and carus amouthe promeration of tele-communication carriers — was simple and well defined. The op-posite is true of the position of network manager, which re-quires a depth and breadth of

Because of the position's complexity, some industry ob-servers say there is a sellers' market for people who fit the

"People who manage networks are in demand, because there are not a lot of people who have the necessary skills in voice and data," says Ivan Frisch, director of the New York State Center

for Advanced Technology in New York.

Steve Joffe, vice-president of recruiter Source EDP in San Mateo, Calif., agrees but says the market for network managers in large corporations peaked sever-

large companies — especially banks that require networks to transfer funds and other infortion — are still a steady arce of demand for network

According to Carol Mason, president of Caroers Manage-ment Associates, Inc. in Bala Cynwyd, Pa., there are also cacynwyo, Pa, there are also ca-reer opportunities in small re-search and development compo-nies that track emerging methods of interconnectivity. "There are always high salaries for network specialists who can handle projects from feasibility studies to design and implemen-tation." When the

"The network manager position is not for someone right out of school," Frisch says. "In addi-tion to knowing the technical-ties, the person has to be able to manage the network team, cus-"she says. Network managers who are working in corporate MIS de-partments will find the most owth in organizations that are oking at their networks to support business applications, ac-cording to Algus Leveckis, man-aging associate of Index Group,

There is greater demand for people knowledgesble about net-work software because it takes aging associate or insert circuly, line. in Cambridge, Mass. He says network managers may find dead ends in organizations that use data and voice networks ger to learn the software than hardware, according to Mike

sparingly as service utilities.

People working on the soft-ware side of network manage-ment often come from a background in systems analysis. People on the hardware side typically begin their careers in outer operations or telecom

implementation.

"The network manager position

int in Franklin Center, Pa. Depending on the compa

and geographic location, net-work managers involved with software can earn annual salaries of \$27,000 to \$45,000, accord-

Network operators, who have moved up from computer operations, earn from \$18,000 to \$29,000, he says, about 20% more than computer operators.

In many companies, the role of the network manager is handled by several people in different departments. At Ramada, Inc., the Phoenix-based

HERE ARE always high salaries for network specialists who can handle proj-ects from feasibility studies to design and

CAROL MASON CAREERS MANAGEMENT ASSOCIATES

> split among corporate accounting, reservation processing and ng to systems programmer

> rent position as a network softmanager from an IBM

The software areas she was required to learn included the network control program and VTAM software, which runs on Ramadn's IBM 4381-based mainframe and 3720 communi

Œ

Rick Landry bro

circios controser.

Rick Landry brought a telecommunications background to
the hardware side of Ramade's
network. "I started out climbing
telephone poles and pulling cable," says Landry, who is now over of communication sys

After being hired by Ramada to work on a local private branch exchange switch, he began to exchange switch, he began to learn about data circuits and mainframe and front-end proces-sor communications. "Learning data communications gave me the ability to expand into my pre-sent position with the reserva-tion center," he says.

sigger challenge bunsey finds the technology of etwork software much more hallenging than traditional ap-lications programming and nalysis. "The technology of ap-fications doesn't change that such," she says. "With the netscal solution." nce a good deal of ne

come a good dear of network hoology is common to MIS curriments across industries, scializing in network software ows a great deal of mobility, here's a lot of opportunity to the from opportunity to

move from company to company," Quinsey says. "Once you have the experi ence, it's very valuable, and three years of hands-on experi-ence in this field is a big invest-

on is a Philadelphia-based free



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# MARKETPLACE

# After the 3090 S announcement

Price slide for 3090 base models continues as users swap for S machines

### BY MARY JAKUBOWICZ

Large-scale secondary market activity remained at a standstill for several weeks after IBM'a much-anticipated Enterprise ruch-anticipated Enterprise system/3090 S announcement in late July. Because of the com-plexity of upgrade options and fiancial incentives, most users and that a three- to four-week me frame was necessary to completely decipher and evalu-ate the new IBM mainframe op-tions that lay in front of them.

tons tunt lay in front of them.

In liste August, the dam finally broke. Secondary market activity began to resume as end users clet they had IBM's latest meinframe puzzle solved. Used trading for 3090 machines — base models as well as F — 15. nor puzze storved. Descend unit of the 2000 mar use 2000, and use 2000 machines — base which have not begun to trade dels as well as E models — artirely on the secondary married to pick up as some users let. The 3090 Model 150E is not to swap out their existing idels as well as E models started to pick up as some uners

base and E machines and buy new from IBM while others de-cided that the used market rep-resented their best bet for a

mainframe acquisition.
The secondary market for 3090 E machines was active during late August and into September. According to third-party market contacts, demand was healthy and supply was ample.

healthy and supply was ample. Since that time, however, the supply of 3090 E models has begun to tighteen, and used values for these mainframes have held steady since late September.

IDC Financial Services Corp. has set the fair market value for the 3090 Model 180E and above at 72% of retail, with the exception of the 280E and the 500E, which have now been to trade

below the larger 3090 E model

below the larger 5090 E models.
During the second quarter of 1988, the 3090 Model 600E was still unavailable on the secondary market. However, since that time, a used market has developed for this mainframe because of IBM's 3090 S model announcement in late lally. According to contacts, most 600E machines that are trading used are moralled from buse-model.

The 3090 Models 400E and 200E have declined approxi-mately six points on the second-ary market since June and July, ary market since june and july, with the largest part of this de-cline being realized midway through the third quarter. But since late September, used prices for the 400E and 200E have remained relatively stable. 78% retail, while an upgraded 400E was trading at 79% retail. The Model 200E is trading used for the same percent of list as the

Since the June/July time frame, overall declines for the

nancial Services expects this downward trend to continue for the 3090 base models, as users continue to swap out their exist-ing base machines for IBM's 2000 Condition 3090 S models.
Currently, the 3090 Mode

IBM mainframes

3090 Model	Date shipped	MIPS	List price	Retail percent of list price
600E	Second-quarter 1987	76.0	\$11,069,500	72%
400E	Second-quarter '87	55.8	\$8,544,500	72%
200E	Second-quarter '87	30.8	\$4,585,970	72%
400	Third-quarter 86	49.0	\$8,544,500	60%
200	Third-quarter '85	27.2	\$4,585,970	60%
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3090 base models have been rel-200 and 400 are trading used for

attively constant. According to altively constant. According to current IDC Prinancial Services research, used prices have fallen approximately 1½ to two points a month aince mél-june, IDC Francial Services (72-820).

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# The price of in-house training

Should you charge a premium price, discounted rates or no fees at all?

### BY NAOMI KARTEN

u are going to charge for the cuse courses you offer your ems professionals and end s, what should your courses

erably from one company to an-other, from less than \$50 for a me-day class to more than \$750 or a three-day class. But often there is no apparent rhyme or reason to the range of fees for a company atraining program. If you are just implementing a

If you are just implementing a chaical or end-user training ogram or gearing up to bill for already established training rriculum, there is a range of stors to keep in mir-4

curriculum, there is a range of factors to keep in mind.

Clarify your objectives. Is your objective to cover your expenses for the next budget year or to operate your training central as a profit center? In either case, you need a clear idea of the costs of running the training pro-gram, including staff salaries, overhead, equipment, materials and facilities. You also need to know the approximate number

of training units (the number of training days multiplied by the number of students per class) you intend to deliver, unless your objective is to instill a sense of value among the students who attend your training and among the managers who pay for it. If so, you have more flexibility in

view the fees set by training ven-dors for the courses you are of-fering. If your intest is to decrease the demand on a limit-of training staff and encourage attendance at courses provided. ce at courses provide by local vendors, you can set prices at vendor prices or highprices at venoor praces or mgo-er. If you want to promote great-er use of your own training facil-ties or discourage use of outside vendors, try setting them appro-priately below wendor prices. Establish ressonable

Establish reasonable fees. These fees should be neither too high nor too low. Low-cost products and services are sometimes perceived as having

A fixed fee per student per train-

to advise managers of fees for the next budget year. Be pre-pared to work with managers to help them analyze their overall help them analyze their owerall training needs so they can plan realistically. It is especially help-ful if you can review their prior year's training in terms of what it would have cost had fees been in effect at the time.

Keep fees fixed. It is best to avoid the impression that pub-lished fees are as unstable as per-

F YOU are just implementing a technical or end-user training program or gearing up to bill for an already established training curriculum, there is a range of factors to keep in

class, \$250 for a Cobol class and \$350 for an IBM CICS class when each is the same length. As a practical matter, however, it may be necessary to lower the may be necessary to lower the fee for one course to remain competitive with outside ver-action to increase the fee de-dors or to increase the fee de-pay for special materials. Provide advance notice, Give managers utificient notice of the intent to implement course fees. As budget planning, time approaches, it is important

sonal computer technology. In general, try to set fees that you can live with for a full budget year. If it becomes necessary to adjust a course fee (either up or down), keep the adjustment as

down), keep the adjustment as small as possible to minimize the impact on long-term training plans and to avoid conveying an image of "let" see what tomor-row will bring." Formulate a cancellation policy. Training departments may benefit from a cancellation policy that bills departments for

no-shows who do not notify the training department of the can-cellation by, for instance, one hour before the class. Charging for a course reduces the number of students who do not show up. Of course, given

not sow up, to course, given the priority-interrupt nature of the business world, people will often an expension of the business world, which was a substantial of the same called in an be called in at the last missue will help ensure that slots do not remain unfilled.

Consider free training for novice end users. In particu-lar, evaluate the pros and cost of offering free training for your in-troductory course. The plus side is that it is good way to encour-age users to get started and to clearly convey the message that you welcome and support nov-ices.

ices. On the minus side, you may be faced with classes filled with too many of the wrong people. Since almost everyone wants at least a smattering of computer literacy regardless of whether they seed it for their pio, the free-for-all approach may result in large numbers of students who do not have a good business reason for being there.

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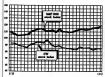
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Dec. 5	LAN's	•	Nov. 18		
Dec. 19	IBM-Compatible PCs/PS2				
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# STOCK TRADING INDEX



Indexes.	Lost Week	This Week
Communications	99.5	97.7
Computer Systems	93.2	92.7
Software & DP Services	101.7	99.6
Semiconductors	57.0	55.7
Peripherals & Subsystems	79.0	78.3
Leasing Companies .	114.1	115.8
Composite Index	84.4	83.6
S&P 500 Index	118.3	117.3











# Computerworld Stock Trading Summary





OCKORNO OCCURRANCE

.....













# Laughingstock

Instability of market fueled by takeover rumors, Quayle's tales

NELL MARGOLIS



# Campaign

ident of Below, Tobe & rs, Inc., a Los Angeles-Associates, Inc., a Los Angeles-based firm providing computer-nided campaign services to 16 state Democratic Party organi-zations as well as Massachusetts Gov. Michael S. Dułaskin' cam-paign. "Everyone still does what they did, only a lot more and a lot faster."

ral fundamental factors milveral fundamental factors mil-te against a mojor role for mputers in a presidential cam-ga. "Campaigns are mostly de up of people who are com-ter-litterate, so we've got to vise a seeup that a computer-terate can use," said Michael ompion, who oversees con-ter support at Vice-President orge Bush's headquarters in shingtoe, D.C.

George Bush's headquarters in Washington, D. Washington, D. C. Thomas B. Hofeller, director of computer services at Republican National Committee head-quarters in Washington, added another argument for keeping campaign operations lear. "One of the things you have in policies in a very dynamic attuation — loss of turnover."

At Bush headquarters, two blocks from the White House.

At Bush headquarters, two blocks from the White House, more than 400 campaign work-ers adhere to the keep-it-simple principle; there is no humming mainframe, no overloaded net-work, no hint of technological so-

phintication.
Instead, nearly 100 assorted
stand-alone personal computers
— inany of them leased —
streamline mundane office
chores such as word processing
and spreadsheet tabulation. On
the road, staffers draft speeches

needed complexity to an already hectic situation. We'd run some-one to death just trying to stomp out fires."

Auntionally, it does not make economic sense to pour money and technological know-how into something that dies so quickly the Federal Election Commis-sion dictates that each cand-date a headquarters be disman-tled within 30 days after the

A minor concern Even at Republican National Committee headquarters — where an MIS shop almost 30 wnere an MIS shop almost 30 strong oversees a large Wang Laboratories, Inc. VS 100-based automated office, a Digital Equipment Corp. Vaxcluster-based voter list and a targeting and ambies project by and analysis project that never folds (it's always election season newhere) cutting-edge

somewhere) — cutting-edge technology is not a high protty.

"Almost every problem I've encountered in computer-land turned out to be a management problem, not a technical problem." Hoteller said.

The Dukaisic camp survived at the Democratic National Covertion in July sporting a DEC Microwax II, 12 terminals, attractional contents of the problem of the problem of the problem. rked Apple Computer,

Inc. Macintosh computers and an array of application and devel-opment tools that have remained th the campaign. Staffers said the machines

handle mostly drudge work, thus freeing volunteers to make phone calls or get out and talk to Dukakis' public relations en-gine is also fueled by Proviz, an gizer from Pixelogic, Inc. in burn, Mass., that allows cam-gn workers to quickly exploit

nd write reports with a pair of SM portables. "We want just enough to get photo opportunities by record-ing and digitizing photographs on diskettes and then loading the We want just enough to get Thompson said. "A mainimages into the Macintosh,

Clear majority
More than half of all voters cast ballots on
machines rather than by manual methods



where they can be quickly print-

In this way, Dukakis could be shaking hands with the mayor of San Antonio at noon — and the press would have a release and an accompanying photo by 1

an accompany, o'clock.
There are, however, instances in which computer-engendered additions have triggered less cosmetic and more qualitative change in a high-powners of the company. The political campaign. The ere speed" advantage loses its "mere" in situations like the

one recently confronted by ans Democratic gubernal candidate Evan Bayh. "Some of our issues po

ronted by Indi-

"Some of our issues people have our opponent" contribution records up on a computer, where they're able to maniyes them for all kinds of patterns and trends," said Fred Nation, Bayt's press sceretary, One Friday, in the last veeks of the campaign, "about 1,000 pages of re-cords of contributions to our opponent" campaign came in."

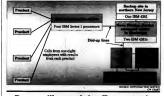
The delaye was timely, Nation said, because Bayth was

about to be challenged on a contribution issue. Only through the use of an on-line analysis could the Bayls team sort through the voluminous information quickly enough to make a preemptive strike at a Saturday afternoon

On the record Back in Washington, the Rep lican National Committee jogs ommittee jogs its notes, an on-line ng on a VAX e runni

Counting the votes

ore than 100,000 "one night employs n' of the News Election Service start



# Dewey will never defeat Truman again

t seems so easy. Tom Brokew rustles through scattered papers, eyeballs them quickly and then raises his eyes toward the camera as he solemaly states whether Bush or Dukakis will be receiving mail at 1600

A or Dukakis will be receiving mas at 1000 Pennsylvanis Ave. next year.

But between the time you pull that curtain behind you in the voting booth tomorrow and the moment you bear the final national results, more than 100,000 people will have worked back-breaking bours to deliver the statement it took Brokaw — or Peter Jennings or Dan Rath-

took Broksw — or Peter Jemining or Dan Ration — on Steed Stread.

At the eye of the modal a vote-guthering buricase is the Manhittan-based News Election Service (NES). This joint service of the ABC, CRS and NEC Levision networks and the Associated Press and United Press International is charged with counting the votes.

"We re the word's largost notebook," said in the common of the common of

comparison. The Similary are also available to other media or generations for a fine, with the prize of each NSS findings are also also according to tase. "Orderway, it is cheeper if you want to key Delaware than it." NSS begin to a manusculo one-clight task soon after the mode clears on the last election of the control of the control

teers for a contribution to their organisation.

On election night, the reporters fan out — normally one per voting district — and wait for the votes to be counted. This process, too, promises future streamlining: Nindorf Computer Corp. reconsty introduced a computeriosed voting matchine using touch-screen technology, which could lide counting time considerably. Once the numbers for the presider ate and gubernatorial races are scribb

the reporter phones a regional telep tion center in Dallas, Chicago or Cin ool center in Daniss, Uncago or Cincinnati.

Operators at the reception center work at in
BM 3151 or 3161 terminal, feeding the num-ners into one of four IBM Series 1 processors.

Chese figures are in turn relayed to NES' Man-states offices, where they are entered into the BM 4381s. A backup 4381 in northern New

JBM 4301k. A usualy 4501 to Bibliograph of the period of t

This is the control of the control o

IAMES DALY

# High-tech a non-issue in '88





e still think that both canon-ties are going to be receptive a working with us," Kay said.
For example, the candidates' osition papers show that both ush and Dutakis support a per-sanent extension of the busi-less R&D tax credit, improve-ments in science education and

BY MITCH BETTS

norrow, citizens will lect a president to ide the U.S. through the information age. But many in the computer com-But many in the computer com-munity are disappointed that the 1988 campaign has featured more talk about prison furloughs and the Pledge of Allegiance than about technology and com-

than about terminogy are con-petitiveness.

IBM Chairman John F. Akers expressed his frustration back in May, when he said: "Let's get out of trivial pursuits and into the key questions of national com-missioning and survival."

sey questions of national competitiveness and survival."

A. G. W. "Jack" Biddle, president of the Computer & Communications Industry Association, is mother executive disappoint of by the nexty issue-less campaigns run by Michael Dukakis and George Bush.

"Whichever candidate wins, "Whichever candidate wins," if a middent that the high-back.

wrachever candidate wins it's evident that the high-tech nology industry has a major task of educating the new administra-tion as to the vital role that techogy plays in our economic E-being and national securi-"Biddle said.

Neglected issues It's not as though there are no

It's not as though there are no technology issues to discuss. Biddle, Akers and other execu-tives cited the following points: Various studies report that the U.S. is in danger of losing the technology race with Japan in key areas such as superconduc-tors, fiber optics and supercom-

puters.

Biddle noted that U.S. co mercial research and developnditures — as a percentage of gross national product — lag behind the R&D expenditures of Japan, West Germany and France.

Since 1972, Japan's manufac

turing productivity index has in-creased eight times faster than the same U.S. index, and West ny's productivity index wn three times faster, acg to the Council on Com-

Flip a coin Computerworld editorial declines to endorse either candidate — but lays out

 Akers, in his May speech, la-mented that 60% of U.S. high school graduates are unprepared for entry-level jobs and that 13% of all adults here are illiterate. The reason these issues got little discussion is that "the intel-lectually honest approach to the

pertitiveness issue is too plicated to fit in a [television] mercial or sound bite," for-congressman Ed Zachau Zachau is now chairman and

Advice for the next president When business economists ranked economic policies in orde priority, reducing the federal budget deficit came out on tob

Reduce budget deficit

2. Enter into free-trade agreement with Canada

3. Speed up productivity growth

4. Boost personal savings

6. Pursue General Agreement on Tariffs and Trade negotiations 7. Permit bank entry into other financial industries

8. Reform securities trading to prevent another market crash

9. Increase antitrust enfo

10. Discourage corporate debt accumulation 11. Curb hostile takeovers

chief executive officer of Cen

computer literacy and a crack-down on white-collar crime. Bush also supports cutting the capital gains tax rate to 15% on investments held for at least chief executive officer of Cen-stor Corp., a comparte pripher-als company in Siltom Valley. Indeed, government support for a robust computer industry and economy involves a best of complex and interrelated trade, tax, budget, research and educa-tion policies. "I assume the can-didates felt that they were too difficult to explain and didn't ad-vance their campaign themes," said Kenneth R. Kay, exacutive director of the Council on Re-director of the Council on Reone year — a proposal support-ed by the National Venture Capi-tal Association and the annal high-tech firms in the American Electronica Association. Duka-Electronics Association. Duka-kis and other opponents said the proposal would be a tax break for director of the Council on Re-

arch and Technology.

A review of campaig

In the telecommunications eld, Dukakis is likely to have a pragmatic approach to regulaWho's in, who's out

Cabinet posts.

The listing is based on Computerworld research and re-ports by National Journal, a political magazine.

BUSH ADMINISTRATION

Telecommunications advisers: Dean Burch, directs general of Intelast and foruser Federal Communications Commission chairman (1969-1974); Richard Wiley, attorney an former PCC chairman (1974-1977). They will help select PC

nominens: "Secretary of Commerce Carroll Campbell, governor of "Secretary of Commerce Carroll Campbell, governor of South Carolin, Robert Monhacher, a Bounds on Sings, 1987. South Carolin, Color Montage of the Carolin C

sensiarie.

- U.S. Trade Representative: Bruce Smart, former undersecretary of commerce (1985-1988); Lamar Alexander, former governor of Irmanesee (1979-1978; Rade Greenberg,
Robert Monischer.

- Astronays Generals Richard Thorsburgh, incundent,
- Astronays Generals Richard Thorsburgh, incundent,
- Astronays Generals Richard Thorsburgh, incundent,
- Secretary of Defensee Frank Carlocci, incundent; John
Tower, former U.S. sensor form fire and Bright; househost.
- Secretary of Defensee Frank Carlocci, incundent; John
Tower, former U.S. sensor form fire and (1961-1983).

- Chairman, Council of Economic Advisers: Michael
Gharys Books of Sensor University.

DURAMIS ADMINISTRATION

\*\*Telecommunications advisers: U.S. Rep. Edward Ma
key (D-Mass.), chairman of the House telecommunication
subcommittee; Charles Ferris, attorney and former Feder
Communications Commission chairman (1977-1981); Hat
Kechane, a Boston public utilities lawyer. They will help sele-

CC commons.

Secretary of Commonree A well-regarded binness executor close 10 Databa, such as Dos Goretta, chairman of the
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A Attention Commonree Commonree U.S. See, The Startman (D-MAL)

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MITCHRETTS

uon, while Bush is likely to sup-port continued but moderate de-regulation of the industry, commented Page Montgomery, vice-president of Economics and Technology. Inc., a Boston-based taken-

AT&T has the most at state
in the presidential electrica, according to George R. Dellinger,
a telecommunications analyst at
Washington Analysis Corp. If
Dutakis wins, the Federal Communications Commission's plan
to remove profit cellings on
AT&T's long-distance unit could
be delivered to be been alleged.

and the "price cap" plan could be changed to reduce the benefits to AT&T, Dellinger reported, If Bush wine as predicted, the price cap regulations will be ap-proved more quickly and with fewer changes, Dellinger pre-

dicted.

Aside from the position papers, a few computer industry issues did get a brief airing in the campaign from mid-September to mid-October. Dutakis and running mate Sen. Lloyd Bertsen (D.-Texan) began hitting a theme of economic nationalism, including an aggressive trade

# **Presentation Manager ships**

But dearth of applications, pricey upgrade stifles user enthusiasm

BY DOUGLAS BARNEY

If user apathy is any indication, IBM and Microsoft Corp. need not have bothered to skip OS/2 Presentation Manager by its Halloween dendline. Too few device drivers, zero spolications and the huge cost of upgrading will keep the software off most

Come.

Even those committed to graphical user interfaces are holding back on Presentation Manager. The fact that users need a high-end latel Corp. 80286 or 80386 processor, a mouse, a hard disk, high-resolution graphics, new software and approximately 5M bytes of randomic management has memory ha dom-access memory has more than a little to do with it, users

Computer managers said they will have trouble justifying he added cost of running the resentation Manager, which is need largely on Microsoft Win-ows, an interface that

top of the firm's MS-DOS. Unless RAM prices fall dramatical-ly, the PC market will remain dominated by MS-DOS and Ap-Computer, Inc. Macintosh erating systems, users said. In an interview after the press briefing last week an-

nouncing the shipment of Preation Manager, IBM Entr terns Division President Wil liam Lowe argued that an IBM Personal System/2 Model 70, readied to run Presentation inager, is no more expensive in IBM's Personal Computer AT 339, bought a year or two ago and fully equipped to run PC-DOS.

Skeptical That argument did not go over well with users. "The introduction [to end users] will be a challenge because of the huge mem-ory requirement," said Gordon Sollars, vice-president of Merrill Lynch & Co. "You can't run with less than 5M bytes," Sollars exned, referring to the memory ded for multitasking.

'We can ask the com

Steve Baltmer, Microsoft's Steve Ballmer, Microsoft's vice-president of systems acfi-ware, claimed that uners need only 2M to 2.5M bytes to get up and running. But Micro Data Base Systems, Inc.'s Object/1 for Presentation Manager will invested require 4M bytes of RAM when it ships next year.

when it ships next year. New machines prepped for Presentation Manager could cost five digit, and urgarding existing machines could run into thousands, users said. Merrill Lynch's Sollars would have to spend some \$2.000 to add an extra .4M bytes to his firm's PC ATS and would have to by present some \$2.000 to add an extra .4M system's period to the state of the said of the sa

on when you bought it," be

Hidden requirements Sollars said he is still not sure this configuration would provide adequate performance. Some us-ers and analysts said they believe a high-speed 386-based machi

m turning the machine into a

sloth.

The complete lack of applications software will also hinder
Presentation Manager implementation. "I have a feeling that
it will be two to five years before
the applications are available;
aid Jim Wat, information centre
technical apposition at a large
Michaelter account of the

Midwestern aerospace firm.

Despite user skepticism, Microsoft officials argued that crosoft officials argued that many software firms are putting more than half their develop-ment resources into the Presen-tation Manager. Wordperfect Corp. is working "farriously" on applications, the officials said,

applications, the officials of and hopes to have a pravailable late next year.

Micrograft, Inc., a lea Windows developer, report expects to ship Presents.

Micrograft of the presents of the Manager applications early next year. However, no timetables were given for major applica-tions such as Lotus Develop-ment Corp.'s 1-2-3 and Ashton-Tate Corp. a Dbase

Waste of time? According to one us

may be wasting their time writ-ing Presentation Manager appli-cations. "After a year of working

will wonder where the custom ers are," said Jim Stoddard, vice

Another roadblock is the lack of device drivers that enable the software to do ess such as appearing on-screen and printing. Today's Presentation Manager contains only a sprink-ling of device drivers and is refore virtually unusable or my systems. Microsoft has

romised an update early next ear that will provide a broader year unit will provide a prosider range of drivers.

One user, delying the critics, said he is champing at the bit.

"We'd he ready to move to it to-morrow if there was a suite of software that would run under it," said Arthur Block, a vice-president at Manufacturers Han-

> over Trust.
>
> Block said his firm will begin
> the migration next March and
> that by Jame the firm will have
> some 1,500 workstations running Presentation Manager.
> These machines will be running
> castom applications based on Mcrossoft's Excel integrated 'a Excel integrate sheet, a product alread nstrated under the Pre

Campaign FROM PAGE 154

110,000 quotes by and about leading candidates. "If Dukakis opens his mouth on any issue," Hofeller said, "we can have a look at anything he's said on that issue within minutes and go from

Perhaps this campaign'a most noticeable computer-related ad-lition is the way in which manes have added fleet-footed ciency to an age-old linchpin sing targeting vot-

Below, Tobe & Associates, for example, uses an IBM 4381 to compile voter databases for its clients. Information on voters—including party affiliation, date of birth, gender, race and how frequently they have voted in the past few elections—arrives daily is whatever form municipal election boards supply. you can turn out 20 losves for ev-ery one you've been baking. You can do a lot more a lot faster, but you still need a good recipe, good ingredients. When all is said and

y in watever form municipal election boards supply. The firm adds ethnic identifi-ers and telephone numbers and orts the voters into households using records collected from ons and the Department of the

ally, the often da ng and man-hour-burning input lask has been significantly aided with the use of handheld computer by the use of handheld computer "wands." The wands read bar codes from coded telephone lists into a PC that uploads — or into a phone that transmits — the information to the 4381.

Once loaded, the mainframe's adjust software goes to work. The result: a degree of personal

### ization in mail and phone calls from a candidate unheard of in Non-issue FROM PAGE 155

"We can ask the computer anything, from Give me all the Democrats in Illinois' to 'Give me all the Reagan Democrats in Illinois 'Give me all the right-on black Jewish Democrats who speak Spanish,' " said Frank Tobe, president of Below Tobe. policy, proposals for education, research and technology pro-grams and criticism of foreign vnership of U.S. companies.
The series of attacks and Bush counterattacks began Sept. 22 at the Intel Corp. plant

Tobe, president of Below Tobe. Still, in the final analysis, politics remains a particularly personal endeavor. "It's like a base that the still are the still and the still are the st in Santa Clara, Calif., where a Bentsen blasted the Rea-gan-Bush administration's trade "This administrat policy. "This administration talks tough on national defense ... but their do-nothing trade policy has left us dependent on Japan for 40% of the computer chips used in our own weapon ry," he said. Bentsen said the administra tion turned its back while sen

ctor makers were "d

Democrats' deep pockets

tributed to state party organizations to ben of candidates, thus skirting the federal limit.

Washington Part obtained a list of big contributors to the scratic National Committee's "soft money" account for Sential contender Michael Dukakis, it was disclosed last

Dukakis followed up by ex-ressing concern about a rise in oreign ownership of businesses ents in the U.S. and prosing that import-battered in-stries get some protection while they adopt new technol-ogies. He also vowed to end the U.S. trade deficit in three years.

"A little surprised"
Bush, responding in a Seattle
speech, suggested that the Democrat was using "fear of foreigners" to gain attention for his struggling campaign. "Frankly I'm a little surprised at my oppo nent's recent turn to protection-ist demagoguery," Bush said. "I don't think he really believes it." Criticising the Dukakis as-Criticing the Dutakis assauks of soriespe ownership, Blush said foreign investment in the U.S. helps create domestic pilos. Despite the Democrat's high-toch pitch, industry executives overwhelmingly support Bush and the Republican Parry's probasiness attitudes. An April poil of the chief executives at 100 computer firms showed that Bush had the support of 50%, compared with 18% for Dutakis and 2% undecklored.

presidential contender Michael Dalakin, it was declosed last work. On the last were Thomae, J. Water, Bill's chismo-emeritus (\$50,000): Lotus Development Corp. and On Tech-nology Co. Sounder Michael Eager (\$50,000): and Comparisoned Regulation of the Content of the Content of the Con-tent of the Content of the Content of the Content (Corp. (\$50,000): Also interesting in the Cort that Stables Adelson, CEO of the Interface Group, Inc., grev big books to both parties: 310.000 for Republica George Buth and \$80,000 for Dalakin, Federal law problishs individual contrib-tions to considiate of more than \$1,000 (pager gifts are dis-cost to considiate of more than \$1,000 (pager gifts are dis-MITCHBETTS

exactly with the political affi-tion of the seasories— 81% Republicans and 18% Demo-crats. Dollatio has a pociet of support in Manuchaestra. Wang, CSO of Wang, Liborato-ries, Inc., John J. Odificane, chairman was president of Princ Computer, Inc., John J. Odificane, chairman Michic Kapor, founder of Lotan Development Corp. The poll, conducted by the Gallay Organization, Inc. for Computer Systems Visus, try believes Republicans are bet-ter at handing US. Unde and exactly with the political affili-

ter at handling U.S. trade and

dget issues.
Dukakis and the Democrats "don't understand how econom-ic progress is made," said Roger W. Johnson, chairman and presi-dent of Western Digital Corp., a vine, Calif.

vnic, Calif.

For example, he said, Dukakis is more likely to pursue protectionist trade policies and continues to "acream at people for moving jobs offshore" despite the fact that such moves serve to make U.S. firms more competi-

Bush is a comfortable choice for the business community, Zschau added, "People in busi-ness at this stage do not want fundamental change" in the direction of government policies, he said Patricia Fakerty, Comp

world editorial assistant, as-sisted with research for this ar-

# Anatomy of a virus

be virus that has caused hundreds of research institutions to shut down their computers appears to be the work of an extraor-

se some 50,000 lines of executable code — acts more like a worm, rapidly moving from one program to another while one program to another white replicating itself without the need for human interaction. In comparison, most viruses attach themselves to a pro-gram, which this particular bug does not seem to do.

Thus far, what is known is that the virus works by rummaging through a computer's files and attempting to identiprocedures. It conspiles a list of possible passwords and then attempts to find out to which network the computer

is linked.

The program then comes up with a list of machines that may be vulnerable to attack and infection. Then it simply orinds away at every possible. ds away at every pos nation until it pene-

using up memory and storage space, slowing down the mais its multipronged attack.

"The thing that makes this little beastle so nasty is how it works in two separate areas," said Jeff Schiller, manager of networks at MIT.

Garbage in . . . On one end, the virus enters the targeted machine through a debug feature in a widely used mailer program on Internet called Sendmisi, a function that was originally used to clean out early bugs in the network. The virus shuts

off the system's security and copies a short program from the host machine to the tar-geted machine. geted machine.

The program compiles and runs and then turns to pull over binary and command files from the machine of which it was readied.

which it was readed.

A second component of the virus makes use of a bug in the network facility in Unix to launch what David Clark; chairman of the Internet Activities Board and a senior scientist at MIT, called an "exentist at MIT, called an "extraordinarily esoteric attack." While the virus does not result in malicious dam-age of files or data, it begins

MICHAEL ALEXANDER

### Virus FROM PAGE 1

ington, D.C.

The Computer Fraud and
Abase Act of 1986 outlaws manhorized access and tamperahorized access and tamperagwith federal computer systems
and gives the Secret Service and
the Federal Bureau of Investigation joint jurisdiction over investigations. Adams said Fridry aftermon that the two agencies
did not have a formal investigation under way.

tion under way. Reports from around the country indicated that the view was prevaled on WAXs and Some prevaled on WAXs and Some or was some of our customers, and we're working with them," a Som spokenweems said Prickly. DEC officials and the view as DEC fecilities and that no customers have yet notified OEC or an infection. A spokenman said DECs afficial soon for compiled Country of the Countr that the virus uses to spread.

West Coast sources said the program works only on systems

running the University of Cali-formia at Berkeley's Unix 4.3 in the Send.mail program; Version 4.2, the sources said, would re-4.2, the sources said, would respond to the program's command but would crash rather than executing its directions. Cole said it has been generally known that Send.mail had this hole but that "no one thought it was innovation."

al nodes consisting of an estimat-ed 250,000 computers in federal

Although no formal investiga-tion was known to be under way Friday, the situation "cortainly has agotten the attention of that has agotten the attention of that by their at one Calinest featur-ment in Washington, D.C., who naked for anonymity, At the U.S. Department of Sates, "we com-ity very seriously," said Themias Nightengale, unformation sys-tem security officer at the U.S. Department of Sates, which was The network is used by re-searchers to transapt programs.

and affected by the wrea.

In a secretary to the secretary to the secretary to transmit groups are, data and information by electrone instill. The view was into-markedly passed along in a buck-tree was a secretary to the secretary that are the computer to another. Hall en-plained. While the view off out computer to another, Hall en-plained with the secretary data on the computer to another the computer to another the computer to the computer

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# MIS reacts

ate activotes, generally limited their actions to neved varnings to users. Polaroid Corp, in Cambridge, Mass., told en-rolled to minimize their exposure to the virus by importably avoiding use of databases estab-ted by neighbor and virus victim MTT.

"We always insisted that our people dost!" (picture sortware or otherwise violate copy-plicate sortware or otherwise violate copy-plicate sortware or otherwise violate copy-plicate sortware afformed.

In general, MIS enecutives reacted to the vittered by focusion on administrative actions.

Lawrence Livermore Laboratories, California. An employee logged on to the system at about 10:00 p.m. from home, the called computer security manager Check Cele is shout 11:00. Cole assembled a five-member term and survived at the hat 12:00 n.m. "By 12:00, we decided it was serious exploration to sever the network." The system week back up Frishy members of 900 n.m. after the committed a patch.

Lawrence Berkeley Laboratories, California. The vir-was detected at 10:00 p.m. Wednesday night, Berkeley ski down immediately. It took a couple of hours to prage the tw San computers that the virus had entered, one of which we running a particle accelerator. When brought back up, the m chine was residented within 30 accords.

Where were you when . . .

Barward University, Massachusetta, According to com-puter sociarity specialist CMF 5001, the worn was through at fel Harrard VALS.—nove than 50 — by the time be found on short it at about 2:00 a.m. East Coast time. "Bit by bit, I dis-connected from the net and rebooted the medimen. Bit is would still pine pong smoot per the machines on the LAN, it's the I'you're sciency after the propies and one has a wearraid and cause; it down to be much good to only treat one. The sunwer is for everyone to per a their of percision."

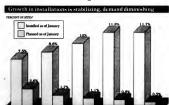
Von Neuman Computer Center, New Jersey, Notified at 2 n.m. Theredry, a team of four employees combed through miscomputers that act as frost ends to its TI fines. They brought down the machines, releaded all the files and, at the same time, "plugged the hole by which the virus entered the one affected machine — a DEC VAX 750," mail eff Huskamp,

ABP

NOVEMBER 7, 1988

### **TRENDS**

# Mainframe spreadsheets



espite the computing community's wait for Lotus Development Corp.'s 1-2-3/M, a mainframe version of

the popular personal compute software, the market for main frame sprendsheets in stagmant. The number of IBM and plug compatible mainframe sites with spreadsheets installed on the host system has revied off, as the number of mainframe site planning installations had dropped to an almost negligible level, according to figures compiled by Focus Research Synpiled by Focus Research Syn-

"The feeling at one time was that [PC and mainframe spreadsheets] would drive each other but using a spreadsheet on a PC is much better. The PC is really the platform of choice, without a doubt," said Scott Brown, an analyst at Focus Research.

Brown said superior response time on PCs is the single most important factor behind their use. However, data center managers often prefer to keep high interactive programs such as spreadsheets off the mainframe

Brown said signs are clear hat the market for mainframe preadsheets will remain the name or shrink in coming years. Among mainframe spread-

Tower Systems Omnicate leads in market share with 28%.

Transportation, communications and utility companies are the largest users of mainframe

STANLEY GIBSO

Market penetration by industry
PROCEST OF STREAMSTORM
TOWNSHIP OF STREAMSTORM
Retained
Retain

Lots of competition for commercial tools



SOUTH COURSESSEARCH SHITTENS BACK

INSIDE LINES

No room at the issue. Bild pegged the 5270 as a Unit processor at the introduction of the 5450 oil pown, and so to weed a Unit Day gave Bild a galdent opportunity to show the contract of the contract of the contract of the Bild's entitle, which included somety everything but the blotchess mid, left out the 5970. The 5000 ministrance, melrange 4581, ET and FSFF were all foresteroid in Bild's "Setending the power of Units" networked display. The 5570 tending the power of Units networked display. The 5570 tending the power of Units networked display. The 5570 tending the power of Units networked display. The 5570 tending the process of the 5700 tending the 5700 tending to the process relaxation but, according to Bild, we not because of "incide Spaces." Apparently, things were a little too tight in the 20,000 suppose feet that TMO concepted in the heaping

How much is it? At Condex/Fall '88, Ashton-Tate will finally annuance once details about SQL Server. The product, scheduled to ship this year but not expected until early next year, will gain an important feature: a prion. We hop it's about.

SQL and more SQL. End users had better get used to it They are going to hear a lot more about SQL at Connelse. Or node will amounce — but not able — its nerver product for OS/2. Borisand will finally show off a wersion of Paradox to contains SQL and will be able to query SQL. Server an IBM's OS/2 Extended Edition. Paradox developers have

A Big Blass mild Mar Again finds and against Microsal infection changed region of the Macinin infection, spendings on change or going of the Macinin infection, spendings have the less of the Macinin infection, spendings have been presented. Mr. sinds on the part of the

A modest proposal ... When will the current leveraged beyond main send One observe, monicing the 300 billion offer being considered by Ell Nakisco, has written as imaginery \$113.2 billion prospecture for some other than Ell James Great, effect of an investment newsletche, certainte the \$1.00 billion prospecture for each other than \$1.00 billion from the \$1.00 billion from the \$1.00 billion from Ell fin shed being considered by Ellion from Ellif a fished re-search and development bulger. And investment between leveryers, accountants and the file would packet \$4.00 billion for doing the final provinger Bulgers and its bloom.

Blue-colley pitch. With the recent introduction of in Divisional Assembles of Ballon platfors, relations allowane to related allowane to relation platfors, resident allowane to the poor computer-integrated manufacturing (SDIA). More covered CDM statistics have not closestic coordinating different steps of a manufacturing (SDIA) and the plant controlled manufacturing (SDIA). More than the plant controlled manufacturing genome by reporting to the plant controlled manufacturing genome by reporting to the plant controlled manufacturing genome and a formation of the state of the plant controlled to the plant controlled manufacturing of the plant controlled manufacturing or state plant and controlled manufacturing which is not at these strongs at the plant control velocity and their twents to get of diverse on by recorded velocity and their twents to get of diverse on by

Paral After last math is formation of the Worm that the to Network, me visited of flad on means get consume to mitting up on B-mail then for this cultum. If you ment to depicts with a manufactory, call the Latt. If you ment to peak Sogitist with a real live mean editor, call 800-343-8474 or 508 573-9700 and many horver deviase with Pate Barrisht, had here a beam of red-bot humans willing and dide to clean

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deffrey whipple had to climb all the way up to the top
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small reminded his of a car he once lessed in
Flagstaff, Arizons just to check things out because
sarlier in the day a message had gotten through that
there was going to be trouble this night so he was
fewling cainous as the dry wind whipped up the dust
around his feet and wondering if he should go on or go
back to came when suddenly, he heard a twis crack
behind his or thought he did but as he turned he

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